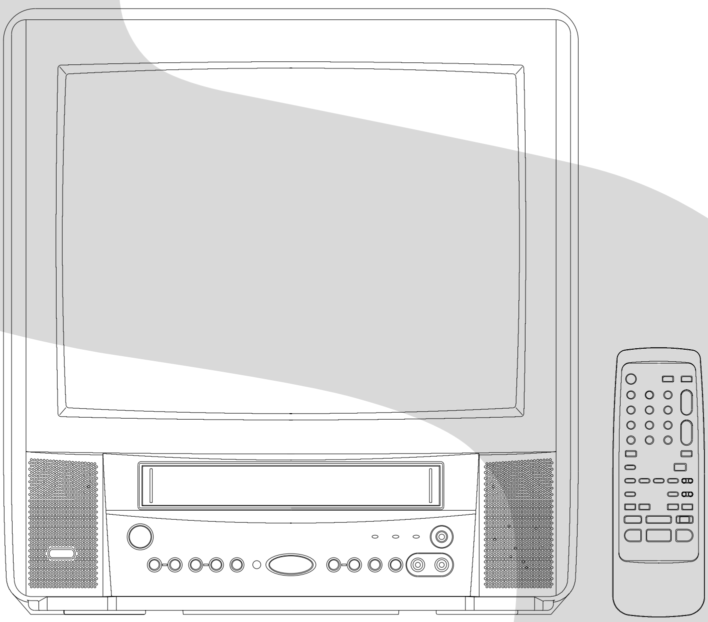
TOSHIBA

FILE NO. 140-200013

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER

MV13K2R



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

GENERAL SPECIFICATIONS

G-1.Outline of the Product

13 inch(335.4 mmV):Measured diagonally
Color CRT 90 degree deflection
2 -Speed 1/2" Video Cassette Recorder

☒VHS ☒Recorder/Player
☐VHS-C ☐Player

G-2.VCR Format

VHS Standard ☒NTSC ☐PAL ☐SECAM ☐PAL-M ☐PAL-N
☐VHS Hi-Fi Audio System

G-3.Video Recording System :Rotary, slant azimuth two head helical scan system
Luminance Component :FM recording
Chrominance Component :Low frequency converted direct recording

G-4.Broadcasting System US System M

G-5.Color System ☒NTSC ☐PAL ☐SECAM or Monochrome signal

G-6.NTSC Playback(PAL 60Hz) ☐Yes ☐No ☒Not Applicable

G-7.MESECAM ☐Yes ☐No ☒Not Applicable

G-8.Cassette Tape

☒VHS type video cassette tape Width 12.65mm (1/2 Inch)
☐VHS-C type video cassette tape Width 12.65mm (1/2 Inch)

G-9.Tape Speed

NTSC or PAL-M		PAL or SECAM	
☒SP	33.35 mm/sec	☐SP	23.39 mm/sec
☐LP	16.67 mm/sec	☐LP	11.69 mm/sec
☒SLP(EP)	11.12 mm/sec		

G-10.Recording/Playback Time

NTSC or PAL-M

☒at SP Mode Max. 210 min. (with T-210 cassette)
☐at LP Mode Max. 420 min. (with T-210 cassette)
☒at SLP(EP) Mode Max. 630 min. (with T-210 cassette)

PAL or SECAM

☐at SP Mode Max. 300 min. (with E-300 cassette)
☐at LP Mode Max. 600 min. (with E-300 cassette)

G-11.Deck

☐OVD-5 ☐OVD-6 ☒OVD-6S

G-12.Rewind/Fast Forward Time(Approx.)

FF:1'48" / Rew:1'48" ☒(with T-120 cassette) ☐(with E-180 cassette)

G-13.Search Speed

☒SP 3 and 5 Times
☐LP ___________ Times
☒SLP(EP) 9 and 15 Times

G-14.Slow Speed

☐SP ___________ Times
☐LP ___________ Times
☐SLP(EP) ___________ Times

G-15.Frame Advance

☐SP ___________ Times
☐LP ___________ Times
☐SLP(EP) ___________ Times

GENERAL SPECIFICATIONS

G-16.Antenna Input Impedance
VHF/UHF 75 ohm unbalanced

G-17.Tuner and Receiving channel ☒1Tuner System ☐2Tuner System ☐BS Tuner
Tuner : Contact less Electric tuner
☐Oscar(W/O HYPER) ☐Oscar(W/ HYPER) ☐France CATV) ☒Others
channel coverage
2 ~ 69, 4A, A-5 ~ A-1, A ~ I, J ~ W, W+1 ~ W+84
Tuning System
☒Frequency syn. ☐Voltage syn. ☐Others

G-18.Preset Channel: -- channels

G-19.Intermediate Frequency

Picture(FP)	45.75 MHz	___ MHz	___ MHz
Sound (FS)	41.25 MHz	___ MHz	___ MHz
FP-FS	4.50 MHz	___ MHz	___ MHz

G-20. Stereo/Dual TV Sound
☐Yes(☐NICAM ☐GERMAN ☐USA ☐JAPAN ☐JAPAN BS) ☒No

G-21.Video Signal
Input Level 1 Vp-p / 75 ohm
Output Level - Vp-p / - ohm
S/N Ratio 50 dB (Weighted)
Horizontal Resolution at SP Mode 220 Lines

G-22.Audio Signal
Input Level
Line - dB / - Kohm
RCA - 8 dB / 50 Kohm
Output Level
Line - dB / - Kohm
RCA - dB / - Kohm
(0dB=0.775 V rms)

S/N Ratio at SP Mode 38 dB
Harmonic Distortion : 1.5 % (1KHz)

Frequency Response :				
	at SP	Mode 100	Hz ~ 10	KHz
	at LP	Mode ___	Hz ~ ___	KHz
	at SLP(EP)	Mode 100	Hz ~ 4	KHz

Hi-Fi Model's Spes ☒NONE
Depth Multiplex Recording Rotary, Slant Azimuth Two Head
System Helical Scan System
Dynamic Range : More than -- dB
Wow And Flutter : Less than --- % Wrms
Channel Separation : More than -- dB
Harmonic Distortion : Less than -- %

G-23.Heads
Video ☒ 2 Rotary Heads
FM Audio ☐___ Rotary Heads
Audio / Control ☒ 1 Stationary Head (☒Mono ☐Stereo(L,R))
Erase ☒ 1 Full Track Erase

G-24.Motor: 3 Motors
☒Tape/Cassette Loading
☒Cylinder (Direct Drive)
☒Capstan (Direct Drive)

G-25.Power Source
120 V ☐AC 50Hz ☒AC 60Hz
☐EXT DC Jack - V

GENERAL SPECIFICATIONS

G-26.Power Consumption: 70 W at AC 120 V 60 Hz(Approx.)
- W at DC - V
(at TV and VCR ON)
Stand by: 5 W at AC 120 V 60 Hz(Approx.)
Per Year: --- kWh / Year

G-27.Dimensions(Approx.) 362 mm(W) 369 mm(D) 382 mm(H)

G-28.Weight(Approx.) Net : 12.5 Kg (27.6 lbs)
Gross: 14.5 Kg (32.0 lbs)

G-29.Cabinet Material

Cabinet Front:	☒PS ☐ABS	☐94HB ☐94V2 ☒94V0	☒DECABROM ☐NON-DECA
Cabinet Rear:	☒PS ☐ABS	☐94HB ☐94V2 ☒94V0	☒DECABROM ☐NON-DECA
Jack Panel:	☒PS ☐ABS	☐94HB ☐94V2 ☒94V0	☒DECABROM ☐NON-DECA

G-30.Cassette Loading System: ☒Front Cassette Loading System ☐Top Loading System

G-31.Tape Counter: Linear Time Tape Counter

G-32.Protector: ☒Power Fuse ☐Dew Sensor

G-33.Regulation

Safety

☒UL	☐CSA	☐SAA	☐SI	☐CE	☐SEV
☐BS	☐NF	☐NEMKO	☐FEMKO	☐DEMKO	☐IEC65
☐SEMKO	☐NZ	☐HOMOLO	☐SABS	☐CNS	☐SISIR
☐NOM	☐AS3159	☐DENTORI	☐UNE	☐GOST	☐NONE

Radiation

☒FCC	☐DOC	☐FTZ	☐PTT	☐CE	☐SEV
☐SABA	☐SI	☐NF	☐NZ	☐HOMOLO	☐UNE
☐CNS	☐CISPR13	☐DENTORI	☐AS/NZS	☐NONE	

X-Radiation

☒DHHS	☐HWC	☐PTB	☐DENTORI	☐NONE

G-34.Temperature
Operation 5 ºC ~ 40 ºC
Storage -20 ºC ~ 60 ºC

G-35.Operating Humidity Less than 80 %RH

G-36.Clockand Timer
Calendar : 1990/1/1 ~ 2081/12/31
Built-in 1 Month 8 Events Programmable Timer
One Touch Recording : Max Time 5 Hours

Sleep Timer	☒Yes Max 120 Min.(10 Min. Step)	☐No
On/Off Timer	☒Yes 1 Programs	☐No
Wake Up Timer	☐Yes _____ Programs	☒No
Auto Shut Off	15 Minutes	

GENERAL SPECIFICATIONS

G-37.Timer back up Time

More than 1/12 Minutes (at Power Off Mode)

G-38.Terminals

☒VHF/UHF Antenna Input ☐Din Type ☒ F-Type ☐ France Type

☒Front Video Input<RCA ø8.3>
☒Front Audio Input<RCA ø8.3>

☐Rear Video Input<RCA ø8.3>
☐Rear Audio Input<RCA ø8.3>

☐Rear Video Output<RCA ø8.3>
☐Rear Audio Output<RCA ø8.3>

☐Ear Phone Jack(ø3.5) ☒Head Phone Jack(Stereo & Mono, ø3.5)
☐DC Jack 12V(Center +) ☐AC Inlet ☐Ext Speaker
☐Diversity ☐Ear Phone ☐21 Pin (x___)

G-39.Indicator

Indicator	☒Power (Red)	☒Rec/OTR (Red)	☒T-Rec (Red)	☐On Timer (______)	☐CS (___)	☐NONE

G-40.On Screen Display

☒Menu ☒Timer Rec Set
☒Ch Set Up ☒TV/CATV ☒Auto Ch Memory
☒Add/Delete ☐Guide Ch Set
☒TV Set Up ☒V-Chip Set ☒On/Off Timer
☒Picture ☐Audio
☐Sap On/Off
☒Auto Repeat On/Off
☒System Set Up ☒Clock Set(☒Calendar ☒12H ☐24H)
☒Language ☒Auto Clock On/Off
☒Standard Time ☒Daylight Saving Time

☐G-CODE(or SHOWVIEW or PLUSCODE)No. Entry
☒Clock/Date ☒CH/AV
☒Tape Counter ☒Tape Speed
☒Sleep Time ☒Tape In
☒Control Level (Vol,Bright,Cont,Color,Tint,Sharpness)
☐Control Level (Vol,Bright,Cont,Color,Sharpness)
☒Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject(Symbol Mark)
☒Auto Tracking/Manual Tracking ☒Caption/Text 1/2
☐Index ☒Repeat
☒Add/Delete ☐Auto Wide On/Off
☐Wide Select ☐Picture Position
☐Tone 1/2 ☐Stereo
☒Muting

G-41.OSD Language

☒Eng ☐Ger ☒Fre ☒Spa ☐Ita ☐Por ☐Jan

OSD Language Setting

☒Eng ☐Ger ☐Fre ☐Spa ☐Ita ☐Por ☐Jan ☐Not Applicable

GENERAL SPECIFICATIONS

G-42.Speaker

Position ☒Front ☐Side ☐Bottom
Size 1.5 x 2.5 inches
Imp. 8 ohm x 1 pcs
Output Max 1.5 W
10% 1.0 W (Typical)

G-43.EXT Speaker

☐Yes ______ W Imp ________ ohm ☒No

G-44.Carton

Master Carton: ☐Need ☒No Need
Content: ---- Set
Material: ---- / ---- Corrugated Carton
Dimensions: ---- mm(W) ---- mm(D) ---- mm(H)
Description of Origin ☐Yes ☐No

Gift Box
Material ☐Double/Brown Corrugated Carton (☐with Photo Label)
☒Double/White Corrugated Carton (☐with Photo Label)
☐Double Full Color Carton W/Photo
Dimensions: 423 mm(W) 447 mm(D) 443 mm(H)
Design: As Per BUYER 's
Description of Origin: ☒Yes ☐No

Drop Test Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces
Height ☐25cm ☐31cm ☐46cm ☒62cm ☐80cm

Container Stuffing: 700 Sets / 40' container

G-45.Accessories

☐Channel Film ☐Dew/AHC Caution Sheet
☒Owner's Manual (☒W/Guarantee Card) [English]
☒Remote Control Unit ☐AC Plug Adaptor
☐Rod Antenna (☐One Pole ☐Two Pole/☐F-Type ☐DIN Type ☐France Type)
☐Loop Antenna(☐F-Type ☐DIN Type ☐France Type)
☐U/V Mixer ☐Quick Set-up Sheet
☐DC Car Cord (Center+) ☒Battery (UM- 4 x 2)
☐Guarantee Card ☐AC Cord
☐Warning Sheet ☐AV Cord (2Pin-1Pin)
☐Circuit Diagram ☒Registration Card
☐Antenna Change Plug ☐PTB Sheet
☐Service Facility List ☒300 ohm to 75 ohm Antenna Adaptor
☐Important Safeguard ☐Euro Warranty Information Sheet
☒ESP Card

G-46.Other Features

☒Auto Head Cleaning ☐Index Search
☒Auto Tracking ☒Auto Search
☒Auto Clock
☐VIDEO PLUS+(SHOWVIEW,G-CODE)
☒HQ (VHS Standard High Quality)
☒Auto Power On, Auto Play, Auto Rewind, Auto Eject
☒Forward / Reverse Picture Search
☐One Touch Playback ☒CATV
☒Auto CH Memory ☒CM Skip(30sec x 6Times)
☒Closed Caption
☒TV Auto Shut off Function ☐Energy Star
☐End Call ☒TV Monitor
☒V-chip(☒USA ☐CANADA)
☐SAP

GENERAL SPECIFICATIONS

G-47.Switch

Front	☒Power	☒Channel Up	☒Volume Up
	☒Play	☒Channel Down	☒Volume Down
	☐Pause/Still	☒F.FWD/Cue	☒Rew/Rev
	☐System Select	☒Eject/Stop	☒Rec/OTR
	☐One Touch Playback	☐Main Power SW	☒Input Select
Rear	☐Color On/Off (SECAM only)	☐Degauss	
	☐Main Power SW		☐AC/DC

G-48.Magnetic Field

☒BV : +0.45G	☐BV : +0.35G	☐BV : +0.25G
BH : 0.18G	BH : 0.30G	BH : 0.30G
☐BV : -0.15G	☐BV : -0.25G	☐BV : -0.50G
BH : 0.15G	BH : 0.15G	BH : 0.30G

G-49.Remote Control Unit:

Unit: RC-DA

Format : NEC

Custom Code : 40-BF/44-BB h

Glow in Dark Remocon ☐Yes ☒No

Power Source: D.C 3 V Battery UM - 4 x 2

Total 41 Keys

☒ 0	☒Power	☒Tracking Auto
☒ 1	☒Rec/OTR	☒Tracking Up/Set +
☒ 2	☒Play	☒Tracking Down/Set -
☒ 3	☒F.Fwd	☒Menu
☒ 4	☒Rew	☒Enter
☒ 5	☒Pause/Still	☒Cancel
☒ 6	☒Stop	☒Muting
☒ 7	☒Eject	☒Volume Up
☒ 8	☒Timer Rec	☒Volume Down
☒ 9	☒TV/Caption/Text	☒Ch Up
☒Sleep Timer	☐Index	☒Ch Down
☒Quick View	☒Zero Return	☒Input Select
☒TV Monitor	☒Counter Reset	☒Speed
☒Call	☒CM Skip(Skip Search)	☐Audio Select(for Hi-Fi)
☐Slow(for 4Head)	☒Program(without V+)	
☐VCR PLUS+/Program(with V+)		

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the screw ②.
3. Remove the AC cord from the AC cord hook ③.
4. Remove the Back Cabinet in the direction of arrow.

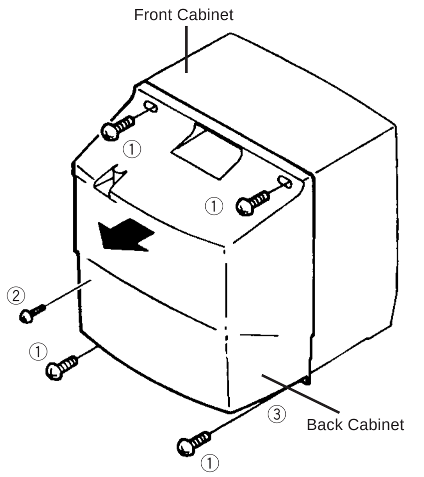


Fig. 1-1

1-2: CRT PCB (Refer to Fig. 1-2)

CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
   (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
   (CP801 and CP851).
3. Remove the CRT PCB in the direction of arrow.

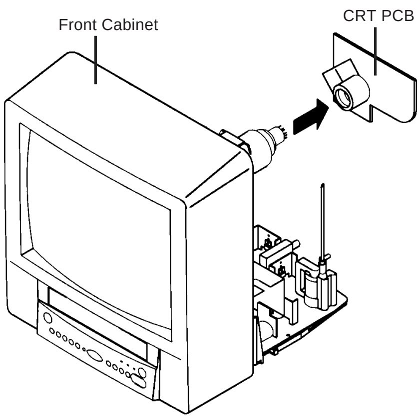


Fig. 1-2

1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
   (CP352, CP353, CP354, CP401 and CP502).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.

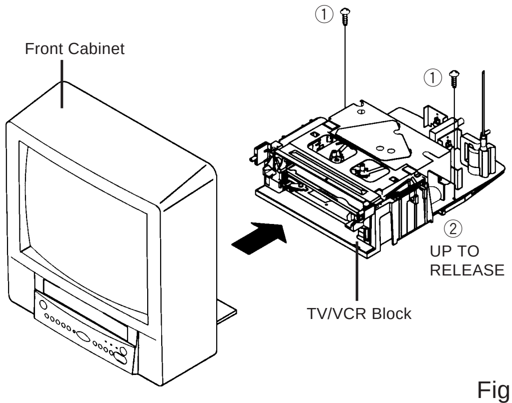


Fig. 1-3

1-4: DECK CHASSIS AND SYSCON PCB (Refer to Fig. 1-4)

1. Remove the 3 screws ①.
2. Remove the 3 screws ②.
3. Disconnect the following connectors:
   (CP1004, CP1005, CP1006, CP4001, CP4002 and CP4003).
4. Remove the Deck Chassis and Deck Shield Plate in the direction of arrow (A).
5. Remove the screw ③.
6. Remove the Syscon PCB in the direction of arrow (B).

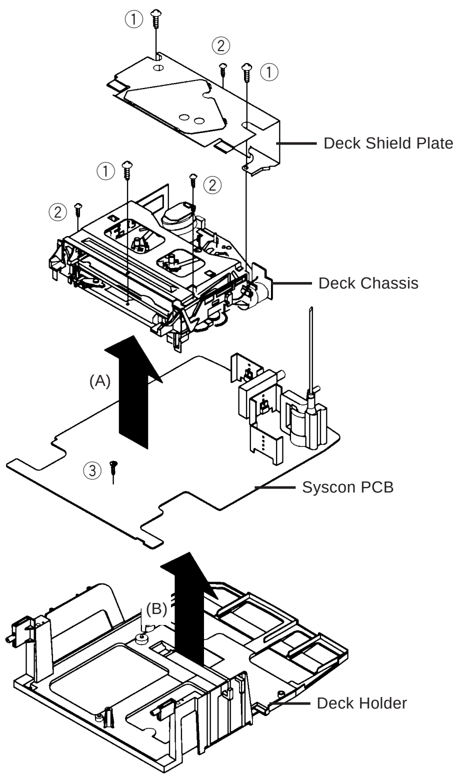


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

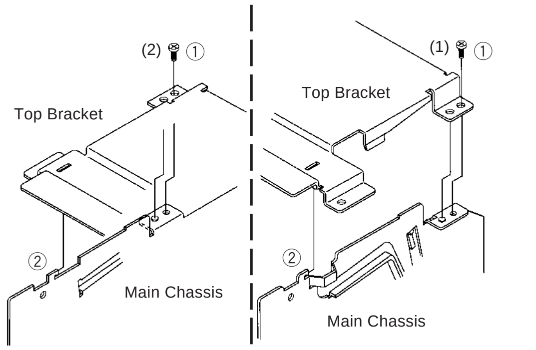
2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Remove the 2 screws ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

When you install the Top Bracket, install the screw (1) first, then install the screw (2).



• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-1

2-2: FLAP LEVER/TAPE GUIDE R (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the Polyslider Washer ①.
3. Remove the Flap Lever.
4. Unlock the 3 supports ② and remove the Tape Guide R.

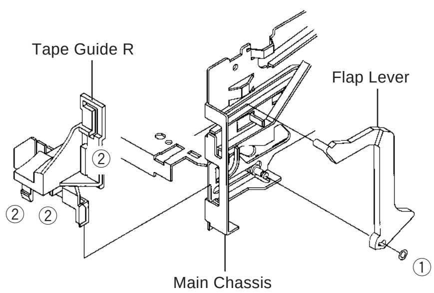
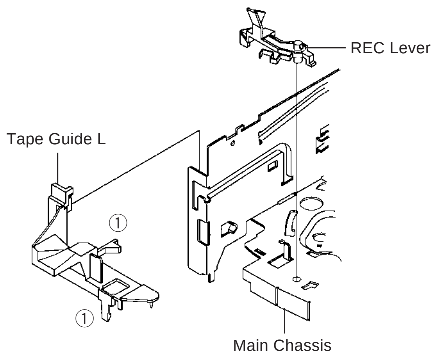


Fig. 2-2

2-3: TAPE GUIDE L (Refer to Fig. 2-3-A)

1. Move the Cassette Holder Ass'y to the back side.
2. Unlock the 2 supports ① and remove the Tape Guide L.
3. Remove the REC Lever. (Recorder only)

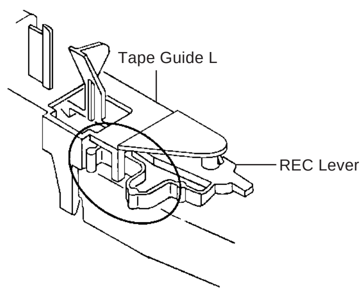


• The REC Lever is not installed on the Video Cassette Player.

Fig. 2-3-A

NOTE

When you install the Tape Guide L, install as shown in the circle of Fig. 2-3-B. **(Refer to Fig. 2-3-B)**



• The REC Lever is not installed on the Video Cassette Player.

Fig. 2-3-B

2-4: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-4)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

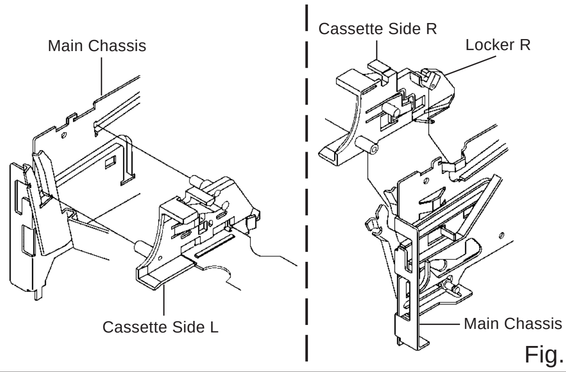


Fig. 2-4

2-5: CASSETTE SIDE L/R (Refer to Fig. 2-5)

1. Unlock the 4 supports ① and then remove the Cassette Side L/R.

NOTE

When you install the Cassette Side R, be sure to move the Locker R after installing.

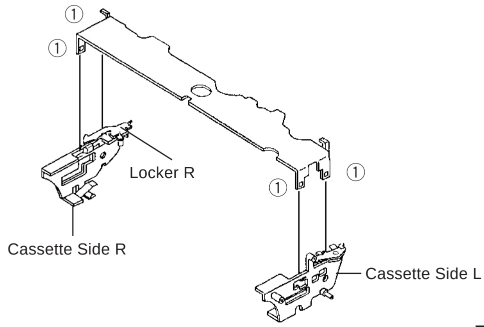


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LINK ASS'Y (Refer to Fig. 2-6)

1. Set the Link Ass'y to the Eject position.
2. Remove the (A) side of the Link Ass'y first, then remove the (B) side.

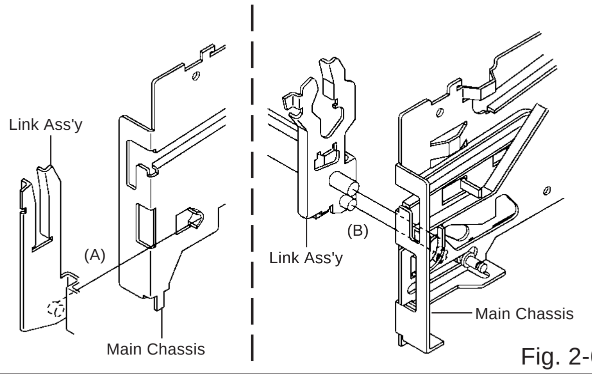
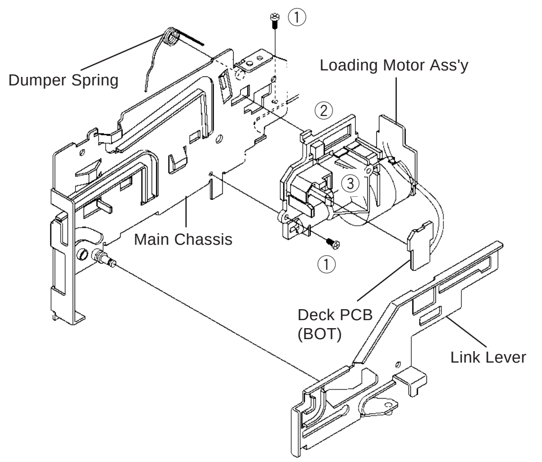


Fig. 2-6

2-7: LOADING MOTOR ASS'Y (Refer to Fig. 2-7)

1. Remove the Link Lever.
2. Remove the Dumper Spring.
3. Remove the 2 screws ①.
4. Unlock the support ② and remove the Loading Motor Ass'y.
5. Unlock the 2 supports ③ and remove the Deck PCB (BOT).



• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-7

2-8: SENSOR COVER L3 (Refer to Fig. 2-8)

1. Unlock the support ① and remove the Sensor Cover L3.

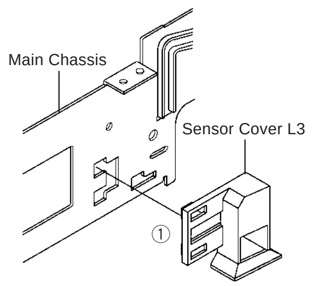


Fig. 2-8

2-9: TENSION ASS'Y (Refer to Fig. 2-9-A)

1. Move the Inclined S Ass'y to the back side.
2. Remove the Tension Spring.
3. Unlock the support ① and remove the Tension Arm Ass'y.
4. Remove the Tension Adjust.
5. Unlock the 2 supports ② and remove the Tension Band Ass'y.
6. Unlock the support ③ and remove the Tension Holder.
7. Remove the SS Brake Spring.
8. Remove the SS Arm Brake.

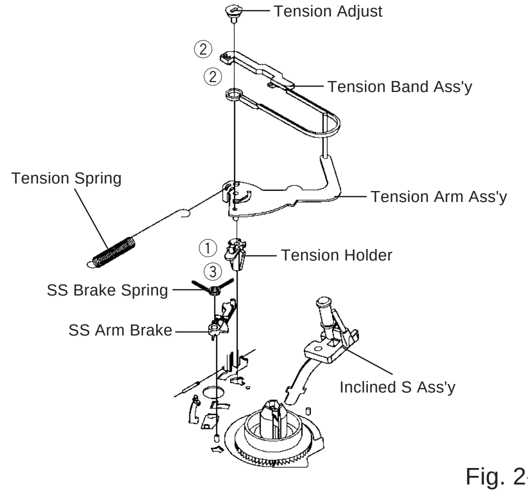


Fig. 2-9-A

NOTE

When you install the Tension Adjust, install as shown in Fig. 2-9-B. **(Refer to Fig. 2-9-B)**

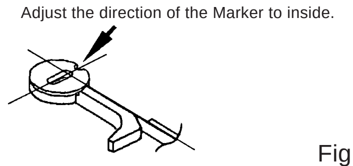


Fig. 2-9-B

2-10: T BRAKE ASS'Y (Refer to Fig. 2-10)

1. Remove the T Brake Spring.
2. Remove the T Brake Ass'y.

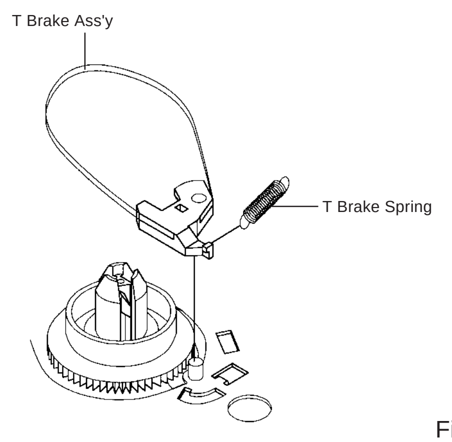


Fig. 2-10

DISASSEMBLY INSTRUCTIONS

2-11: S REEL/T REEL (Refer to Fig. 2-11)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-11)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and oil it. (If you do not oil, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

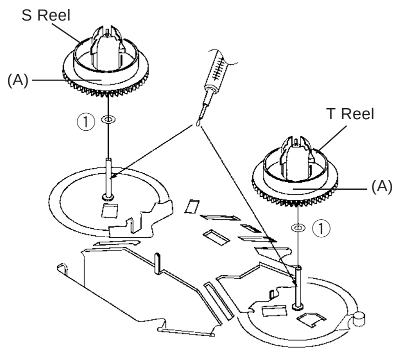
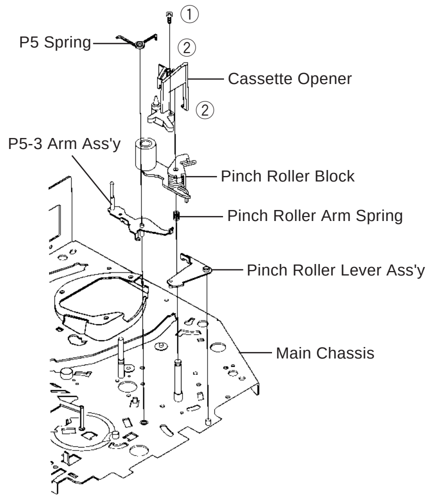


Fig. 2-11

2-12: PINCH ROLLER BLOCK/P5-3 ARM ASS'Y (Refer to Fig. 2-12-A)

1. Remove the P5 Spring.
2. Remove the screw ①.
3. Unlock the 2 supports ② and remove the Cassette Opener.
4. Remove the Pinch Roller Block, Pinch Roller Arm Spring, Pinch Roller Lever Ass'y and P5-3 Arm Ass'y.

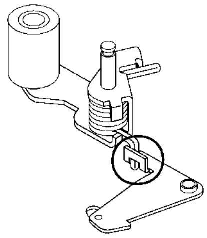


• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-12-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. When you install the Pinch Roller Block, install as shown in the circle of Fig. 2-12-B. **(Refer to Fig. 2-12-B)**

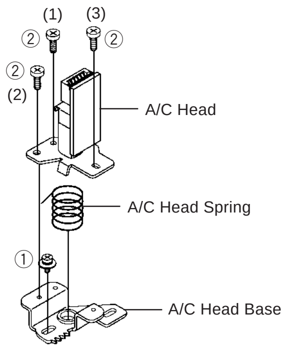

Fig. 2-12-B

2-13: A/C HEAD (Refer to Fig. 2-13-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-13-B. **(Refer to Fig. 2-13-B)**
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: 4 ± 0.5kgf•cm (Screw ①)

Fig. 2-13-A

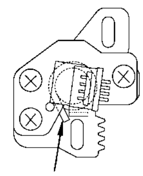
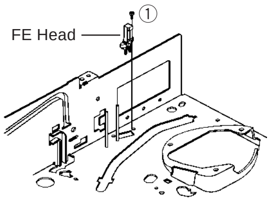


Fig. 2-13-B

2-14: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-14)

1. Remove the screw ①.
2. Remove the FE Head.



• The FE Head is not installed on the Video Cassette Player.
• Screw Torque: 4 ± 0.5kgf•cm

Fig. 2-14

DISASSEMBLY INSTRUCTIONS

2-15: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-15)

1. Unlock the support ① and remove the AHC Ass'y.
2. Remove the 3 screws ②.
3. Remove the Cylinder Unit Ass'y.

NOTE

When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.

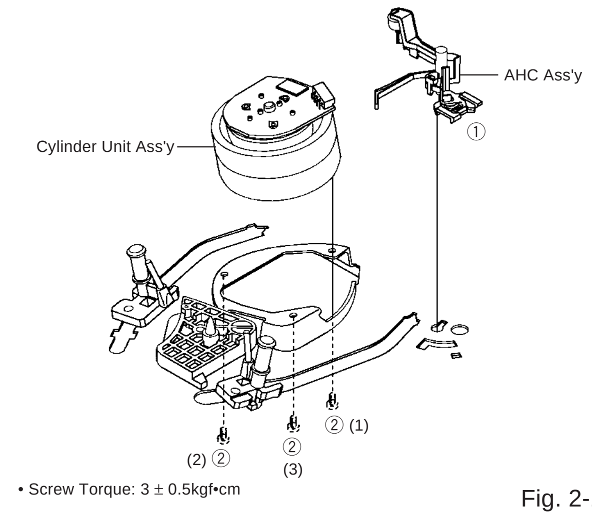


Fig. 2-15

2-16: CAPSTAN DD UNIT (Refer to Fig. 2-16)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

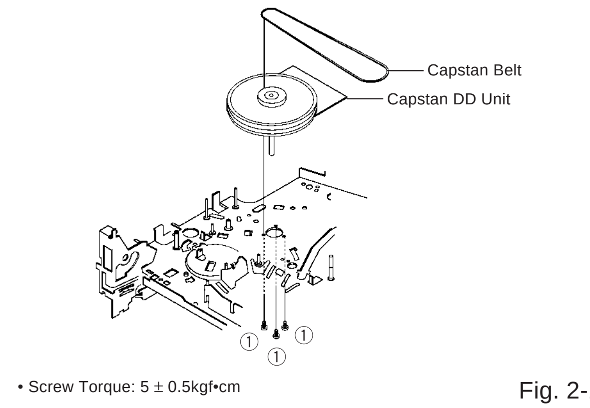


Fig. 2-16

2-17: MIDDLE GEAR/MAIN CAM (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①, then remove the Middle Gear.
2. Remove the E-Ring, then remove the Main Cam, P5 Cam and Pinch Roller Cam.
3. Remove the Polyslider Washer ②, then remove the Joint Gear.

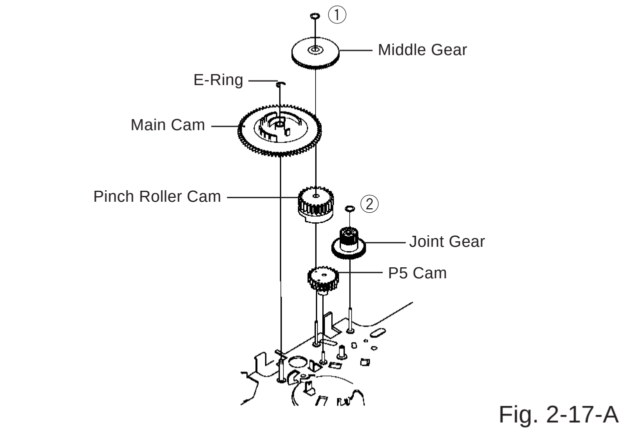


Fig. 2-17-A

NOTE

When you install the Pinch Roller Cam, P5 Cam and Main Cam, align each marker. **(Refer to Fig. 2-17-B)**

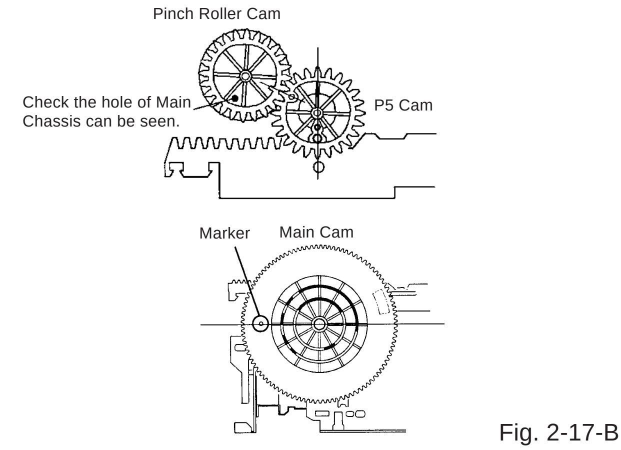


Fig. 2-17-B

2-18: CLUTCH ASS'Y (Refer to Fig. 2-18)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y, Ring Spring and Coupling Gear.
3. Unlock the 2 supports ② and remove the Clutch Lever.

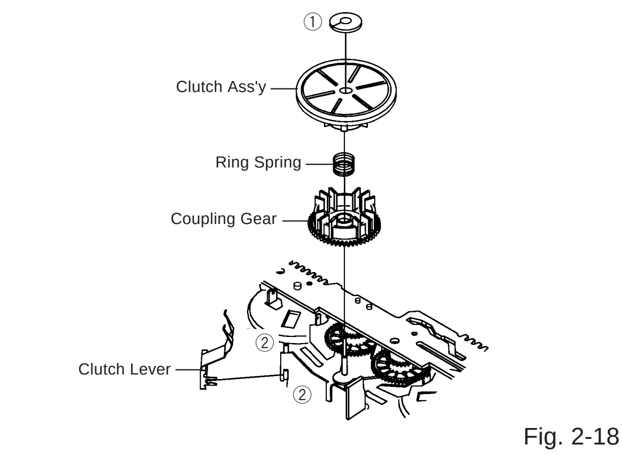
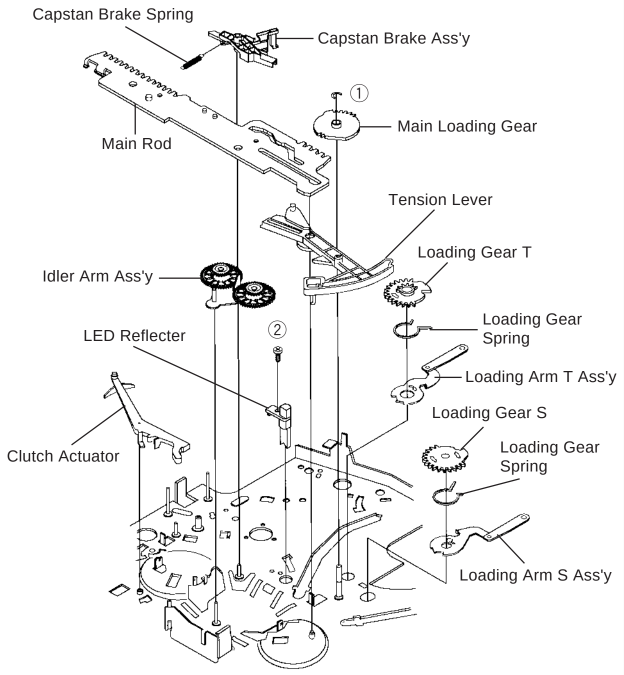


Fig. 2-18

DISASSEMBLY INSTRUCTIONS

2-19: LOADING GEAR S/T ASS'Y (Refer to Fig. 2-19-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Capstan Brake Spring.
3. Slide the Main Rod and remove the Capstan Brake Ass'y.
4. Remove the Main Rod, Tension Lever, Clutch Actuator, Idler Arm Ass'y.
5. Remove the screw ②.
6. Remove the LED Reflecter.
7. Remove the Loading Arm S Ass'y and Loading Arm T Ass'y.
8. Remove the Loading Gear S and Loading Gear T.
9. Remove the Loading Gear Spring.



• Screw Torque: 5 ± 0.5kgf•cm

Fig. 2-19-A

NOTES

1. When you install the Loading Arm S Ass'y, Loading Arm T Ass'y and Main Loading Gear, align each marker. **(Refer to Fig. 2-19-B)**

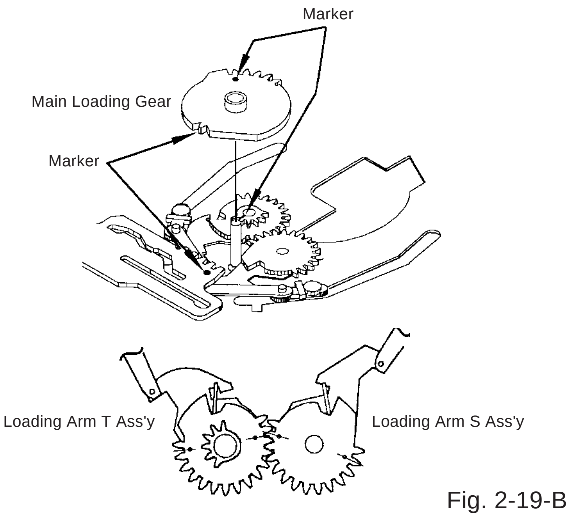


Fig. 2-19-B

2. When you install the Clutch Actuator, install as shown in the circle of Fig. 2-19-C. **(Refer to Fig. 2-19-C)**

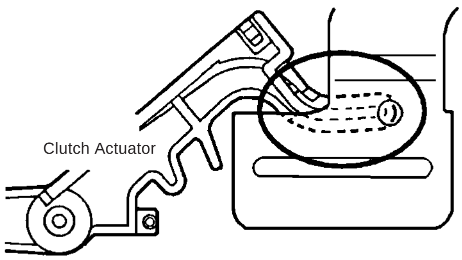


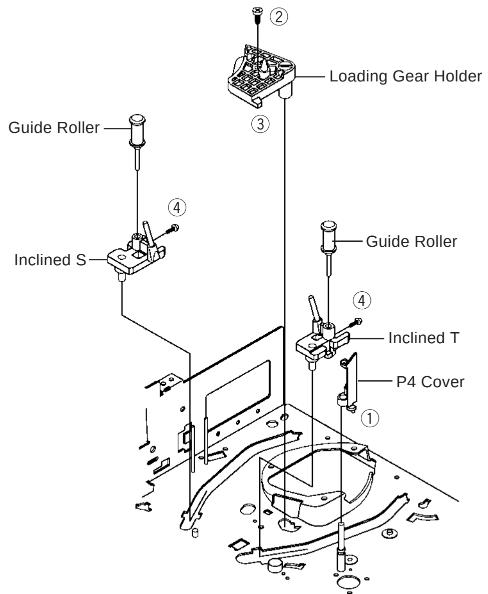
Fig. 2-19-C

2-20: INCLINED S/T ASS'Y (Refer to Fig. 2-20)

1. Unlock the support ① and remove the P4 Cover.
2. Remove the screw ②.
3. Unlock the support ③ and remove the Loading Gear Holder.
4. Remove the Inclined S.
5. Remove the Inclined T.
6. Remove the 2 screws ④, then remove the Guide Roller.

NOTE

Do not touch the roller of Guide Roller.



• Screw Torque: 5 ± 0.2kgf•cm (Screw ②)
• Screw Torque: 0.7 ± 0.2kgf•cm (Screw ④)

Fig. 2-20

DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 3-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

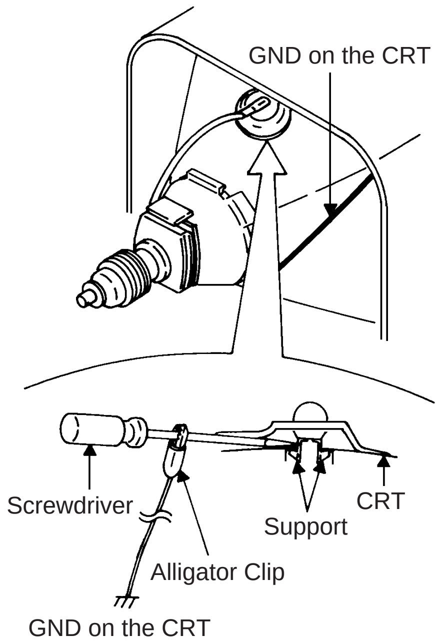


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 3-2.)**

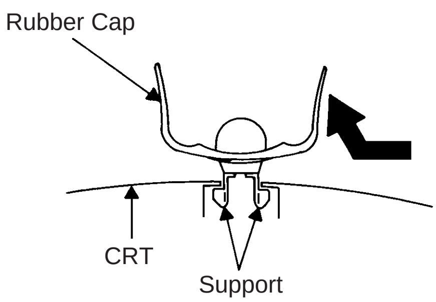


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 3-3.)**

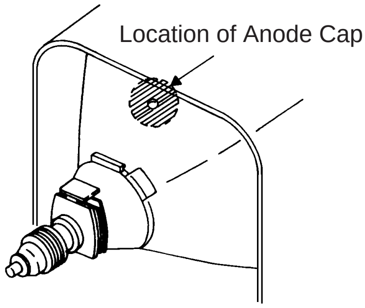
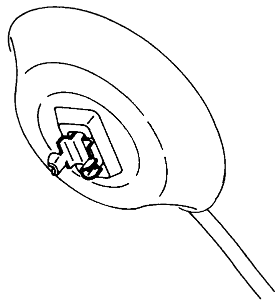


Fig. 3-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 3-4.)**


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 3-5**.

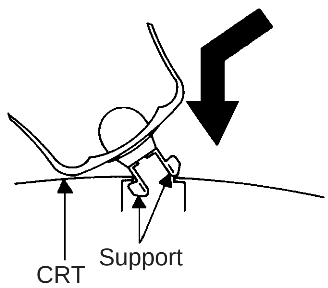


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

KEY TO ABBREVIATIONS

A	**A/C**	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	**BGP**	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	**C**	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	**DATA (SY-CE)**	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	**E**	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	**F**	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	**GEN**	:	Generator
	GND	:	Ground
H	**H.P.F**	:	High Pass Filter

	H.SW	:	Head Switch
	Hz	:	Hertz
I	**IC**	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	**KIL**	:	Killer
L	**L**	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	**M**	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	**NC**	:	Non Connection
	NR	:	Noise Reduction
O	**OSC**	:	Oscillator
	OPE	:	Operation
P	**PB**	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	**R**	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	**S. CLK**	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF USING HOURS). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF MEMORY IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The EOT/BOT/Reel sensor do not work at this moment. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	■	■	
Capstan Belt			■	■	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■	■	■	●	Clean the Head

■ : Clean
● : Replace

CONFIRMATION OF USING HOURS

POWER ON total hours and PLAY/REC total hours can be checked on the screen.
Total hours are displayed in 16 system of notation.

NOTE: The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously.
3. After the confirmation of using hours, turn off the power.

Screen		
INIT 00 83	—	Initial setting content of MEMORY IC.
POWER ON 0010	—	POWER ON total hours.
PLAY/REC 0003	—	PLAY/REC total hours.

(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

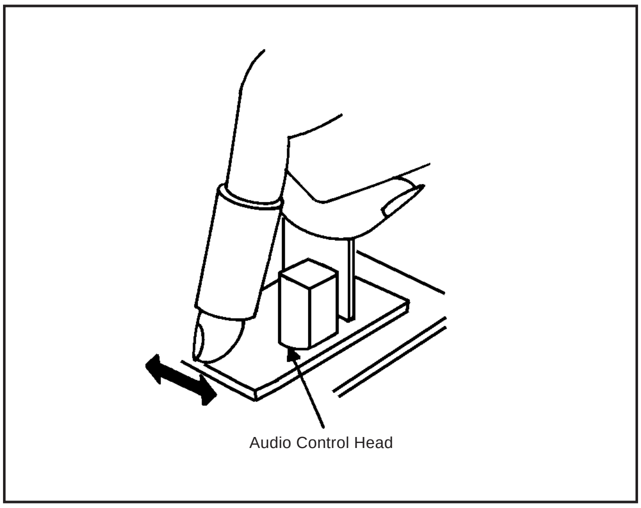
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

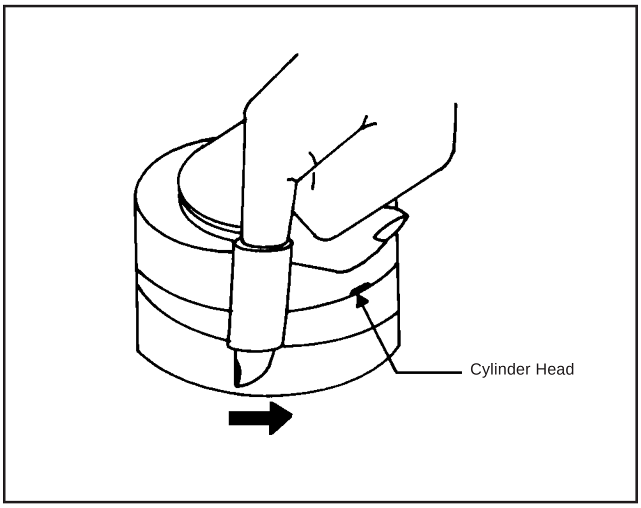
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



NOTE FOR THE REPLACING OF MEMORY IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA
00	88	0A	10	14	00	1E	8D	28	01
01	1B	0B	94	15	00	1F	00	29	00
02	C2	0C	99	16	30	20	00		
03	63	0D	00	17	05	21	00		
04	43	0E	00	18	08	22	00		
05	14	0F	10	19	00	23	00		
06	34	10	8C	1A	A9	24	00		
07	29	11	68	1B	0F	25	00		
08	55	12	5C	1C	04	26	00		
09	38	13	53	1D	39	27	00		

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously. ADDRESS and DATA should appear as FIG 1.

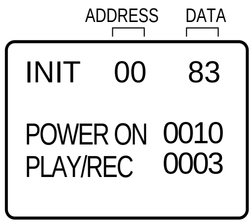
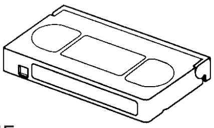
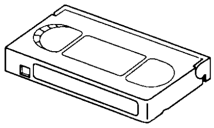
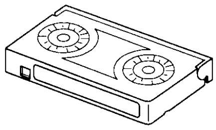
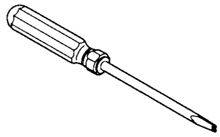
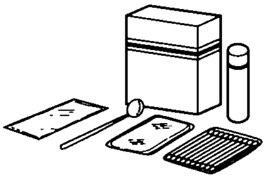
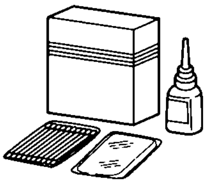
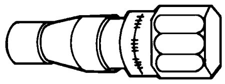
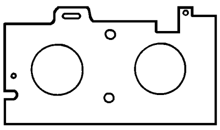
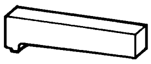
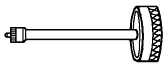
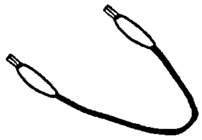
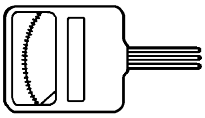


Fig. 1

3. ADDRESS is now selected and should "blink". Using the SET + or - keys on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET + or - until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG154 Cable 
Tentelometer 			

Part No.	Remarks
JG002B	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	Brake Torque (T Reel Ass'y)
JG002F	VSR Torque, Brake Torque (S Reel)
JG153	X Value Adjustment
JG022/JG024A	Reel Disk Height Adjustment
JG154	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Unplug the connector CP353, CP354, then remove the TV/VCR Block from the set.
2. Remove the Operation PCB from the set, then connect it with the Syscon PCB.
   If necessary, connect CP353 (Front A/V Jack Input Terminal)
3. Short circuit between **TP1001** and **Ground** with the cable JG154.
   (Refer to MAJOR COMPONENTS LOCATION GUIDE)
4. The EOT, BOT and Reel Sensor do not work at this moment.
   At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)
- When you activate the deck without the Cassette Holder, short circuit between **TP1001** and **GND**. **(Refer to ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE)** In this condition the BOT/EOT/Reel Sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. Confirm that "A" of the reel disk is lower than "B" of the reel disk height adjustment jig **(JG024A)**, and is higher than "C". If it is not enough height, adjust to 10(+0.2, -0) mm with the height adjustment washer.
4. Adjust the other reel in the same way.

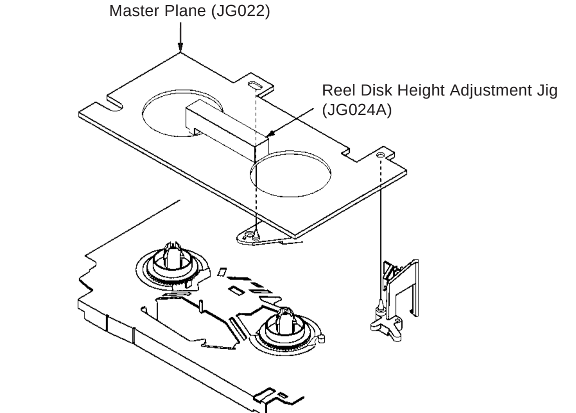


Fig. 1-1-A

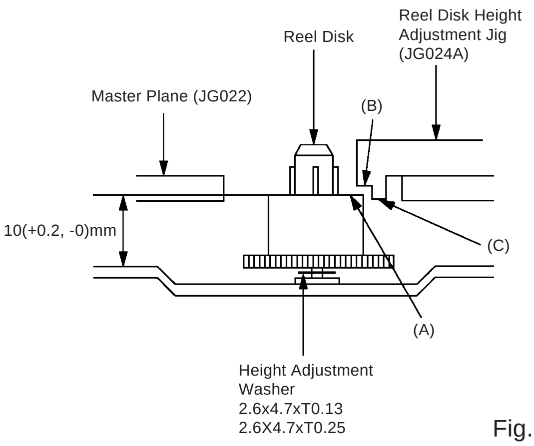


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the Tension Adjust until the edge of the Tension Arm is positioning within 0.5mm range from the standard line center of Main Chassis.
   After this adjustment, confirm that the cut position is located in "A" area as shown in **Fig. 1-2-B**. If it is located in "B" area, adjust again.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

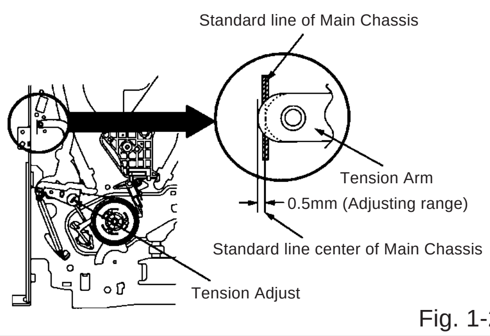


Fig. 1-2-A

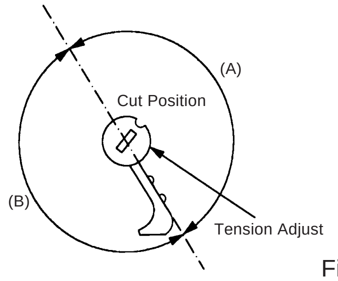


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(KT-300NR)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(KT-300NR)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 60~110gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

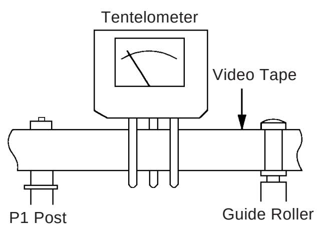


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Operate within 4~5 seconds after the reel disk begins to turn.
2. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Rewind mode. **(Refer to Fig.1-4)**
3. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4)**

1. Set to the STOP mode.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4)**

1. Set to the STOP mode.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 45~70gf•cm.

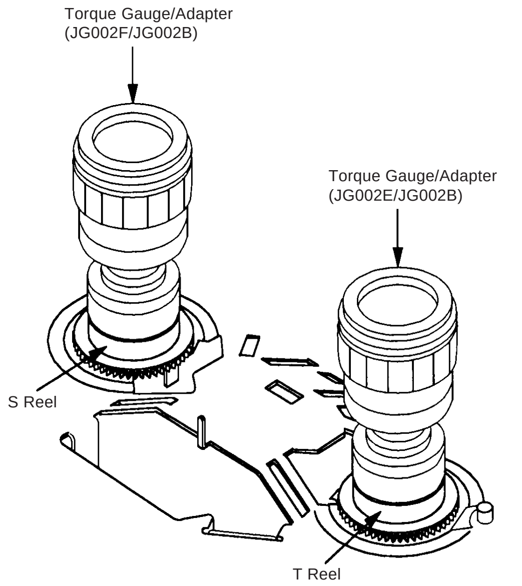


Fig. 1-4

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	T Brake Spring/Tension Spring

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat.
   Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback.
   (Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

After adjustment, confirm and adjust A/C head.
(Refer to item 2-2)

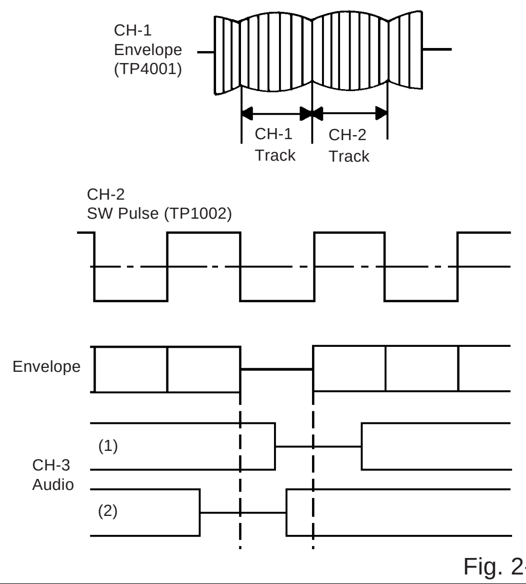


Fig. 2-1-A

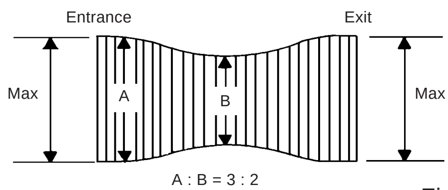


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A**.
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

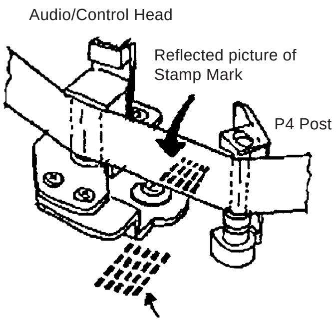


Fig. 2-2-A

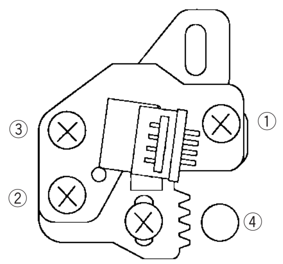


Fig. 2-2-B

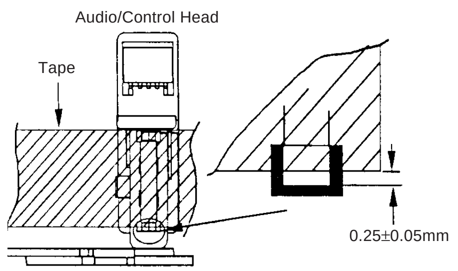


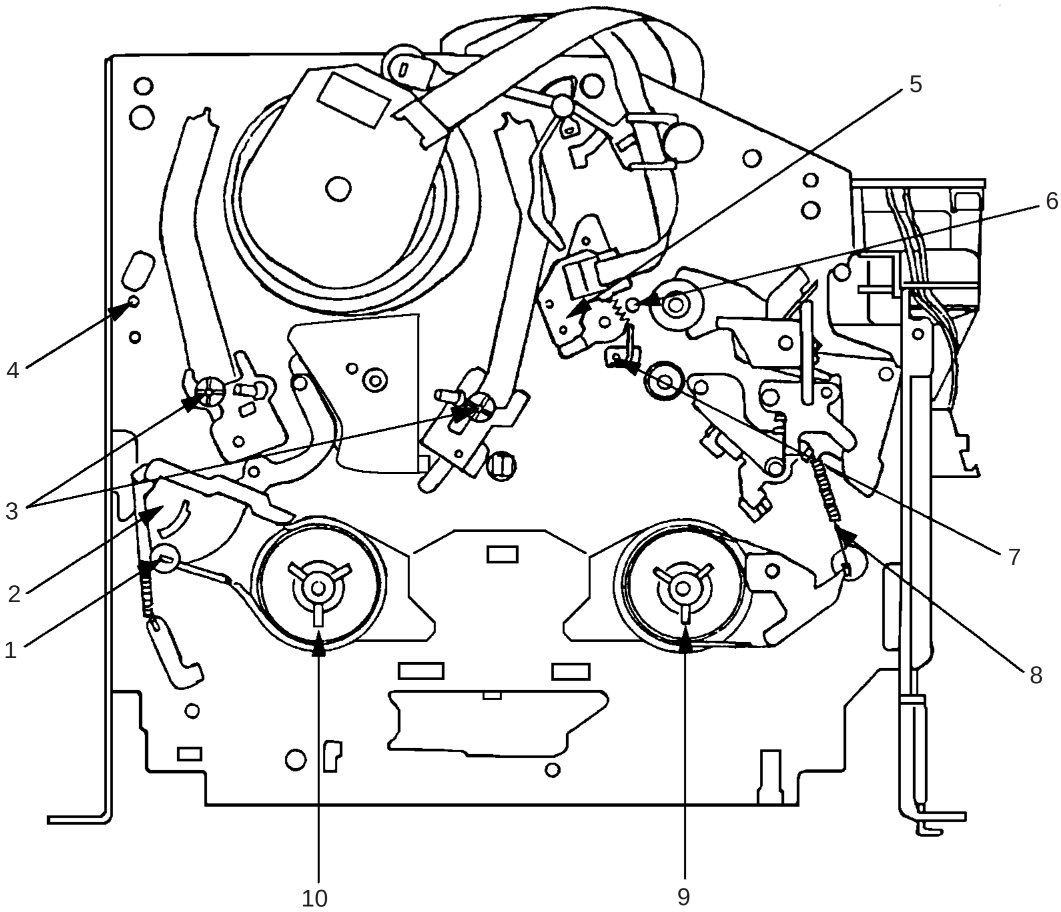
Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP4001**, CH-2 to **TP1002** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-1-A**.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Adjust
2. Tension Arm
3. Guide Roller
4. P1 Post
5. Audio/Control Head
6. X value adjustment driver hole
7. P4 Post
8. T Brake Spring
9. T Reel
10. S Reel

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
  Inferior silicon grease can damage IC's and transistors.
- When replacing IC's and transistors, use only specified silicon grease.
  Remove all old silicon before applying new silicon.

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control simultaneously to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

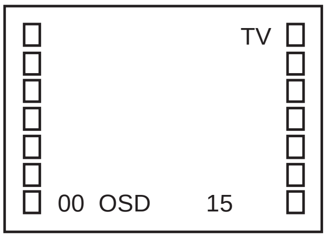


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	13	BRIGHTNESS
01	CUT OFF	14	CONTRAST
02	RF AGC	15	COLOR
03	VIF VCO	16	TINT
04	H VCO	17	SHARPNESS
05	H PHASE	18	FM LEVEL
06	V SIZE	19	LEVEL
07	V SHIFT	20	SEPARATION 1
08	R DRIVE	21	SEPARATION 2
09	B DRIVE	22	TEST MONO
10	R BIAS	23	TEST STEREO
11	G BIAS	24	X-RAY TEST
12	B BIAS		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **pin 4 of CP1003**.
2. Playback the alignment tape.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H.
   (Refer to Fig. 2-1-A, B)
7. Press the Tracking Auto button.

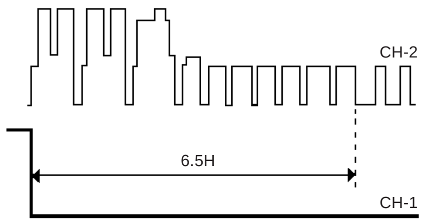


Fig. 2-1-A

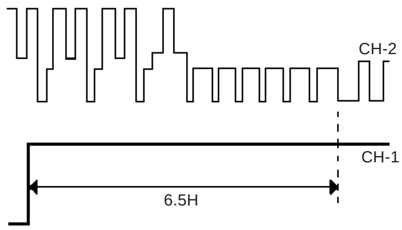


Fig. 2-1-B

2-2: VCO FREERUN

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the VHF HIGH.
3. Disconnect the Antenna while receiving the VHF HIGH and set to the Noise screen.
4. Once turn off the Power and turn on the Power again.
5. Approxi. 3 seconds later, input the Antenna again.
6. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
7. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "VIF VCO".
8. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5 ± 0.5V.

ELECTRICAL ADJUSTMENTS

2-3: RF AGC

1. Receive a 70dB monoscope pattern.
2. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.7 ± 0.05V.

(TV SECTION)

2-4: CONSTANT VOLTAGE

1. Connect the digital voltmeter to the **R520**.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Adjust the **VR502** until the digital voltmeter is 135 ± 0.5V.

2-5: CUT OFF

1. Adjust the unit to the following settings.
   R BIAS=128, G BIAS=128, B BIAS=128,
   BRIGHTNESS=128, CONTRAST=100
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-6: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the color bar pattern.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select "R.BIAS".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R.BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "R.DRIVE", "B.DRIVE", "G.BIAS" or "B.BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R.DRIVE, B.DRIVE, G.BIAS or B.BIAS.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-7: FOCUS

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Turn the Focus Volume fully counterclockwise once.
4. Adjust the **Focus Volume** until picture is distinct.

2-8: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHASE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-9: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SHIFT".
4. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

2-10: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-11: SUB BRIGHTNESS

1. Receive the black pattern*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRIGHTNESS".
4. Press the VOL. UP/DOWN button on the remote control to adjust the screen brightness from bright to dim. Then set to the completely dim point.
5. Receive the black pattern*. (Audio Video Input)
6. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

2-12: SUB CONTRAST

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control to select "CONTRAST".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "85"
3. Press the TV GAME button on the remote control to set to the AV mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "82"

ELECTRICAL ADJUSTMENTS

2-13: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Connect the synchro scope to **TP803**.
3. Using the remote control, set the brightness, contrast, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the waveform becomes as shown in **Fig. 2-2**.
6. Receive the color bar pattern. (Audio Video Input)
7. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

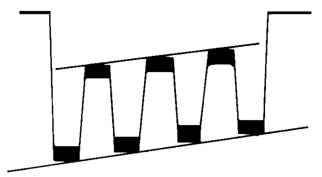


Fig. 2-2

2-14: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the synchro scope to **TP801**.
3. Using the remote control, set the brightness, contrast, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(15)** on the remote control to select "COLOR".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 5 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110% of the white level. **(Refer to Fig. 2-3)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.

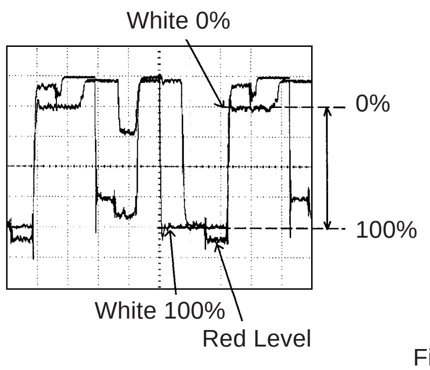


Fig. 2-3

2-15: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-4)**

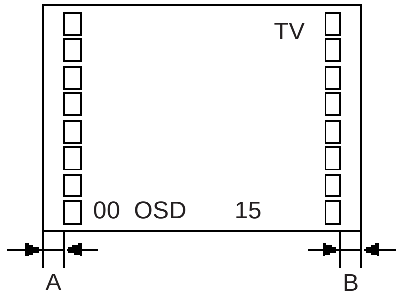
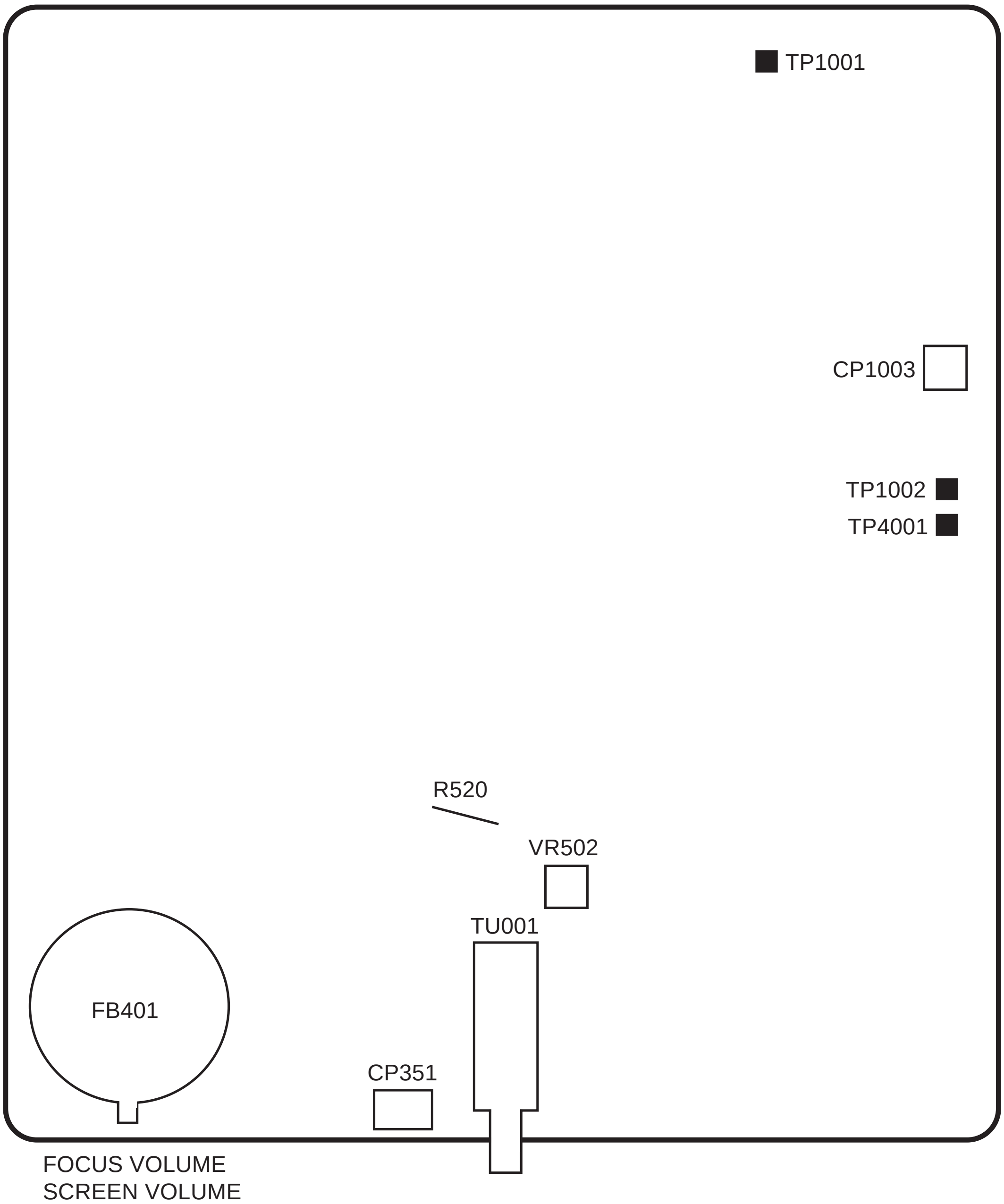


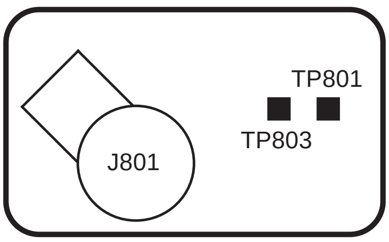
Fig. 2-4

ELECTRICAL ADJUSTMENTS

3. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE



SYSCON



CRT

ELECTRICAL ADJUSTMENTS

4. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

4-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 4-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

4-2: PURITY

NOTE

Adjust after performing adjustments in section 4-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

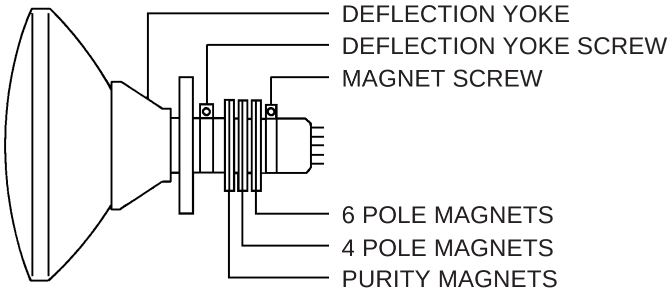


Fig. 4-1

4-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 4-2.

1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

4-4: DYNAMIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 4-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left.
   (Refer to Fig. 4-2-a)
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke.
   (Refer to Fig. 4-2-b)

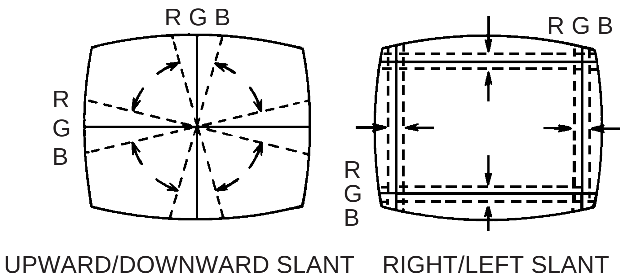


Fig. 4-2-a

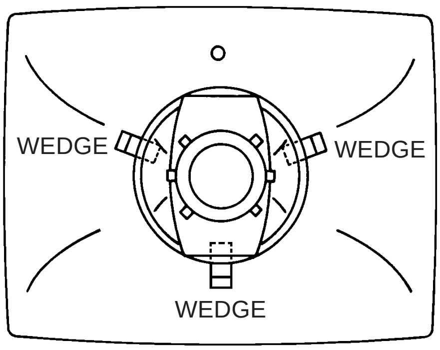
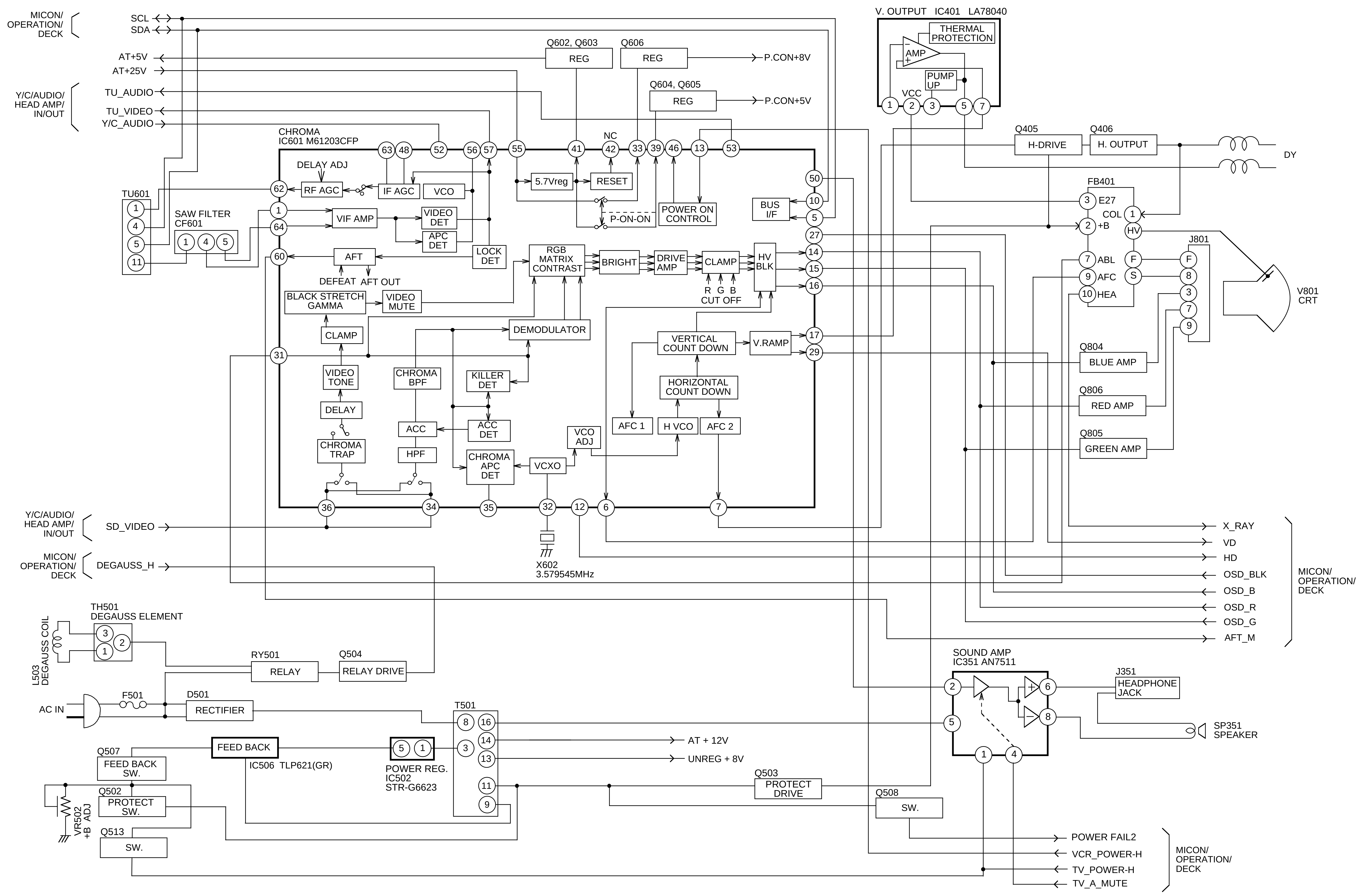
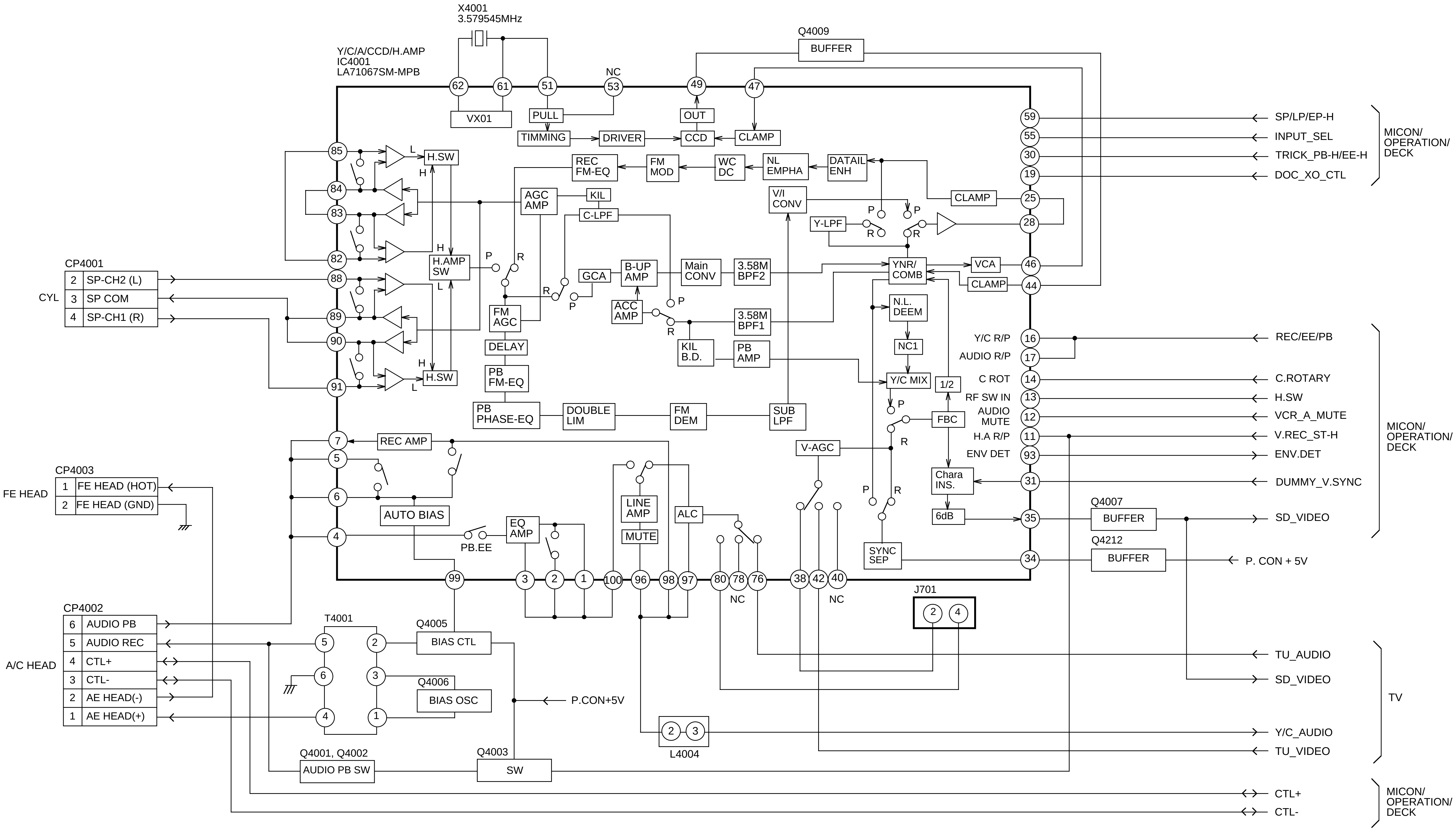


Fig. 4-2-b

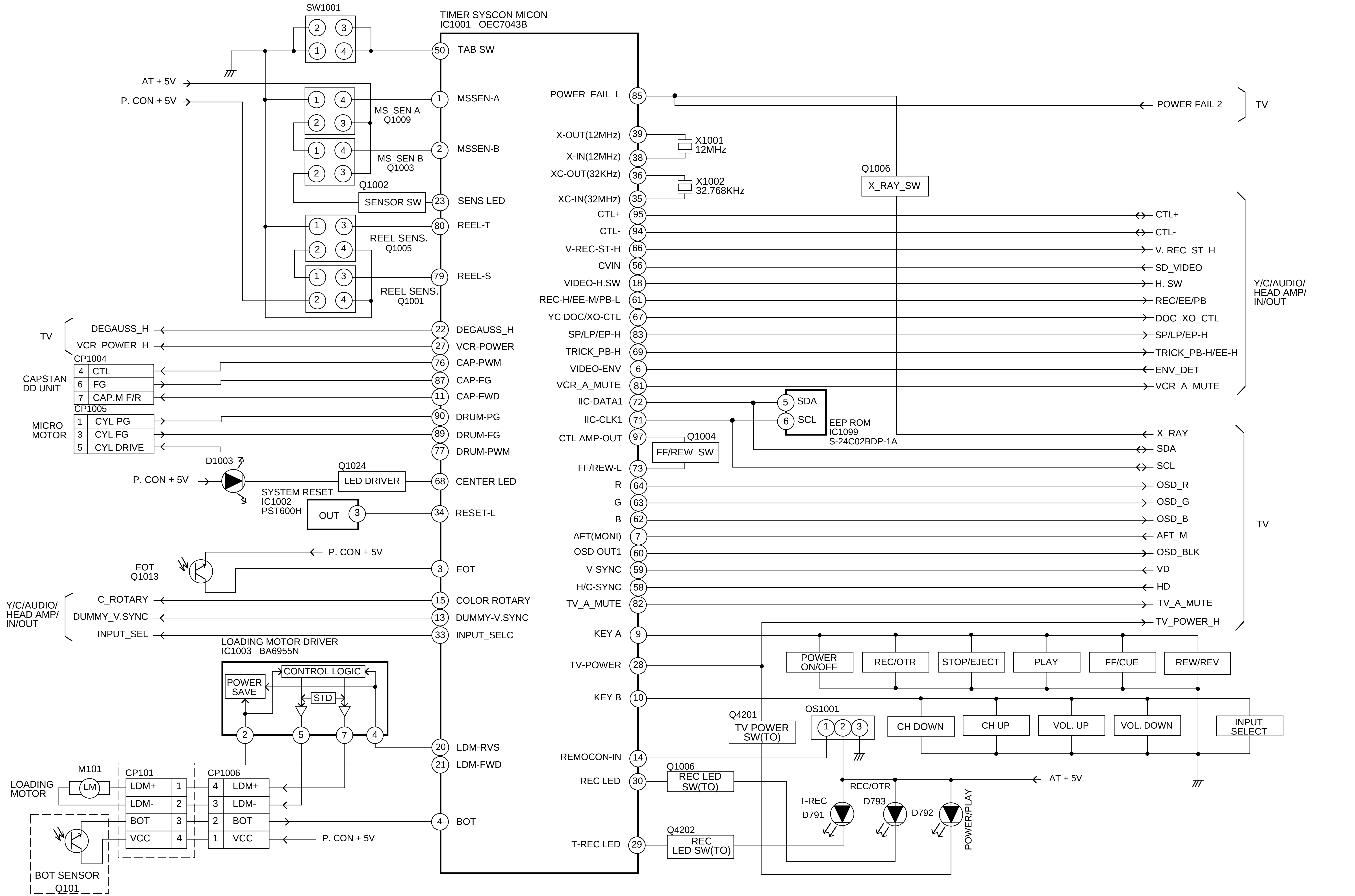
TV BLOCK DIAGRAM



Y/C/AUDIO/HEAD AMP/IN/OUT BLOCK DIAGRAM

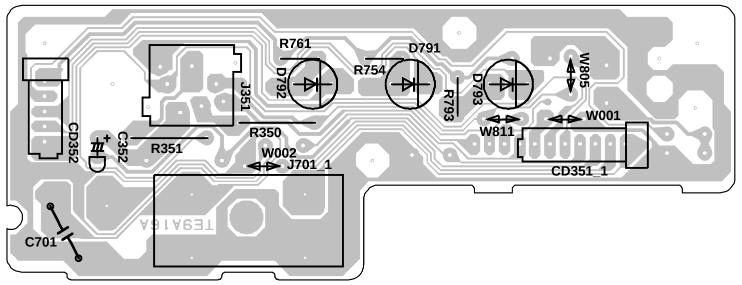


MICON/OPERATION/DECK BLOCK DIAGRAM

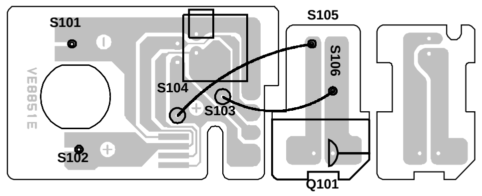


PRINTED CIRCUIT BOARDS

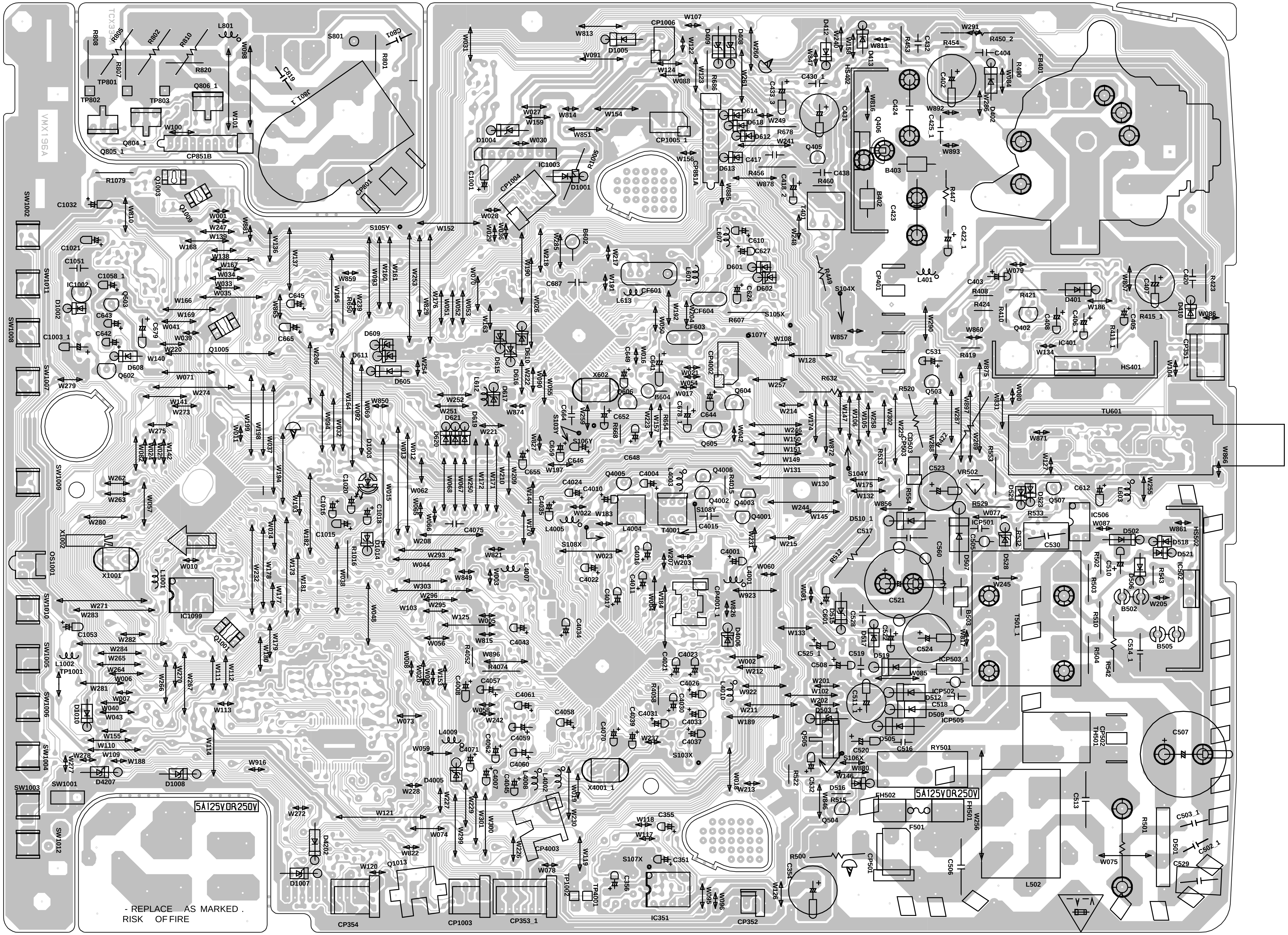
OPERATION
SOLDER SIDE



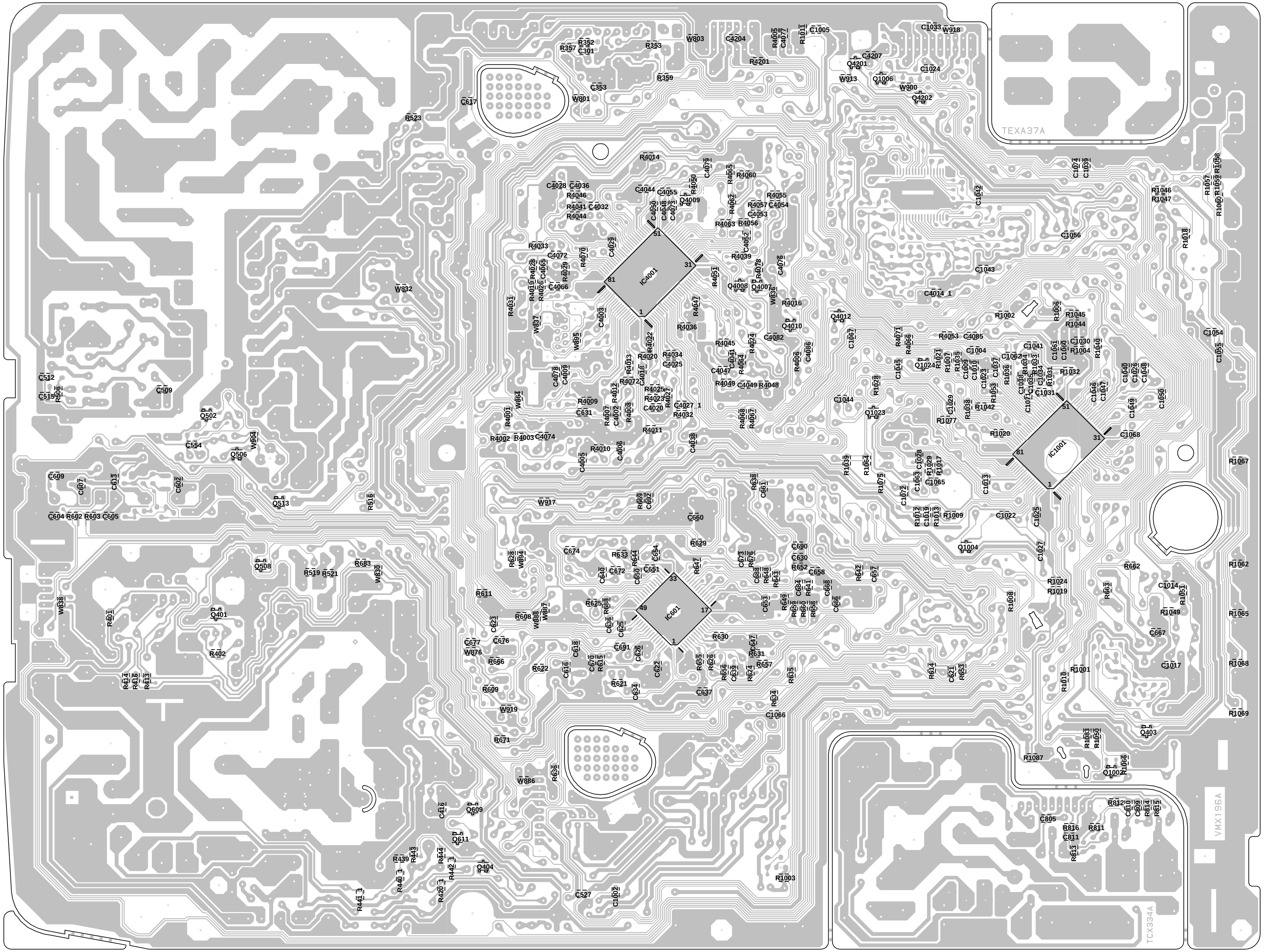
DECK
SOLDER SIDE



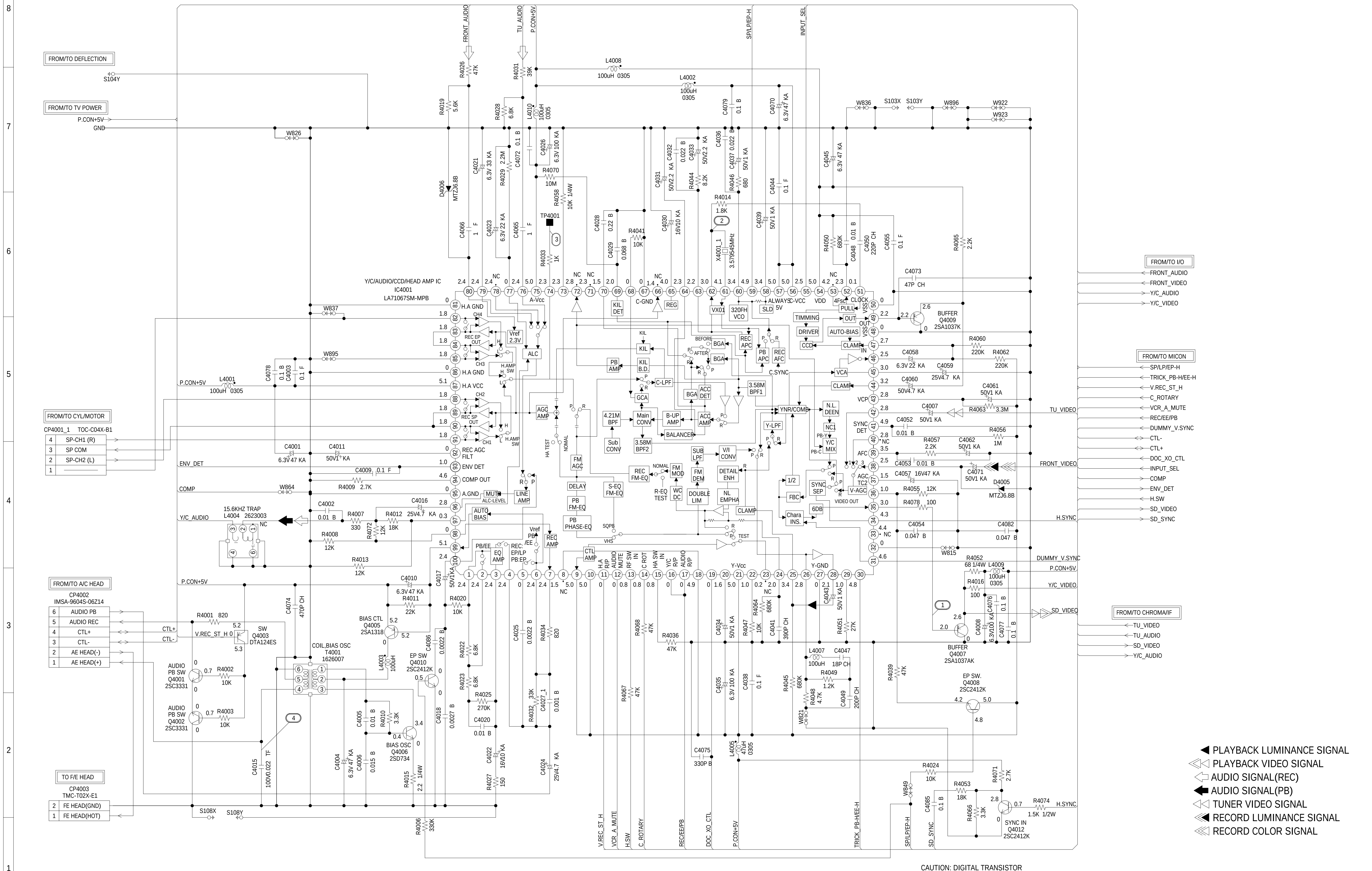
PRINTED CIRCUIT BOARDS
SYSCON/CRT (INSERTED PARTS)
SOLDER SIDE



PRINTED CIRCUIT BOARDS
SYSCON/CRT (CHIP MOUNTED PARTS)
SOLDER SIDE



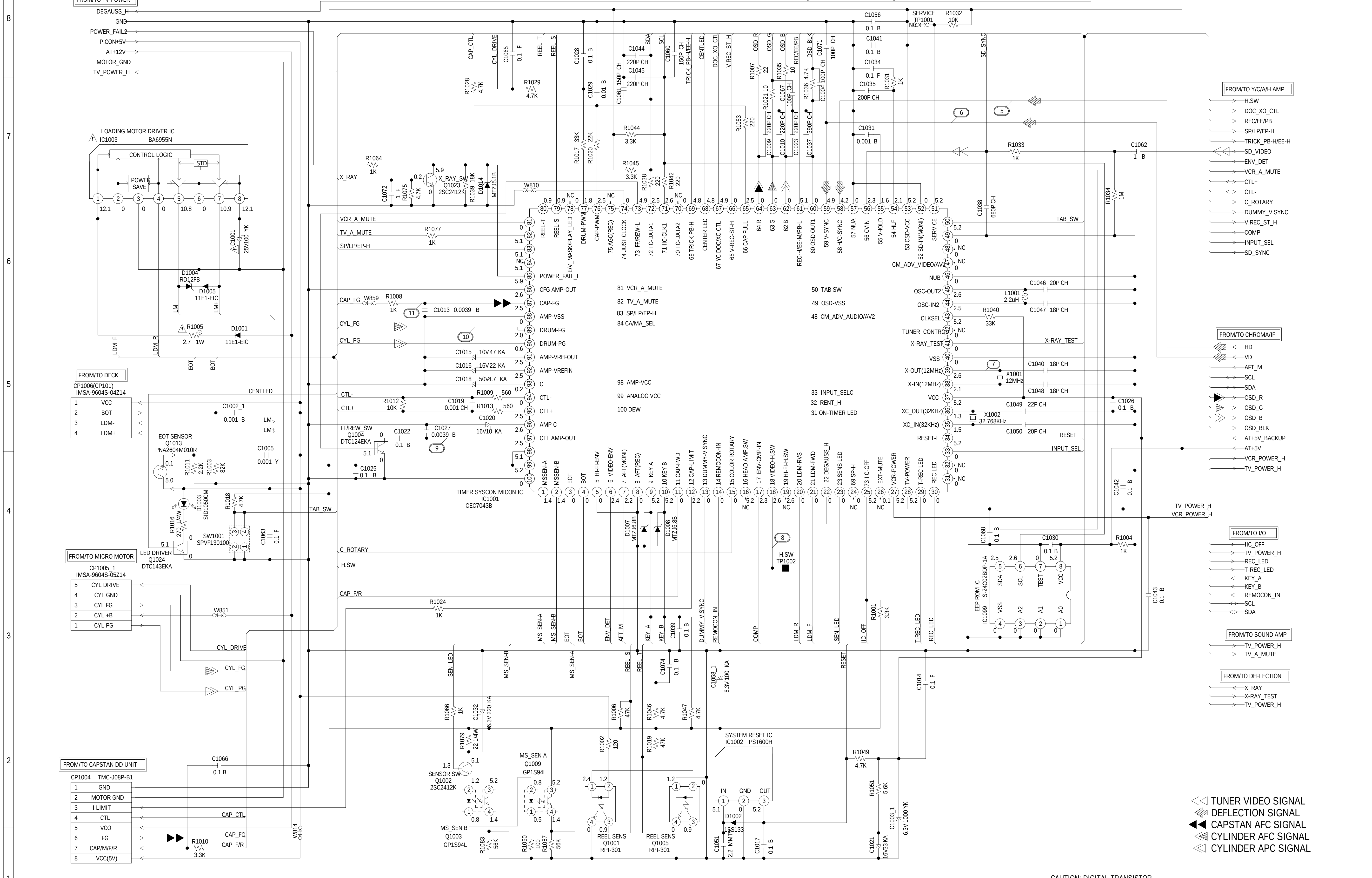
Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

MICON SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

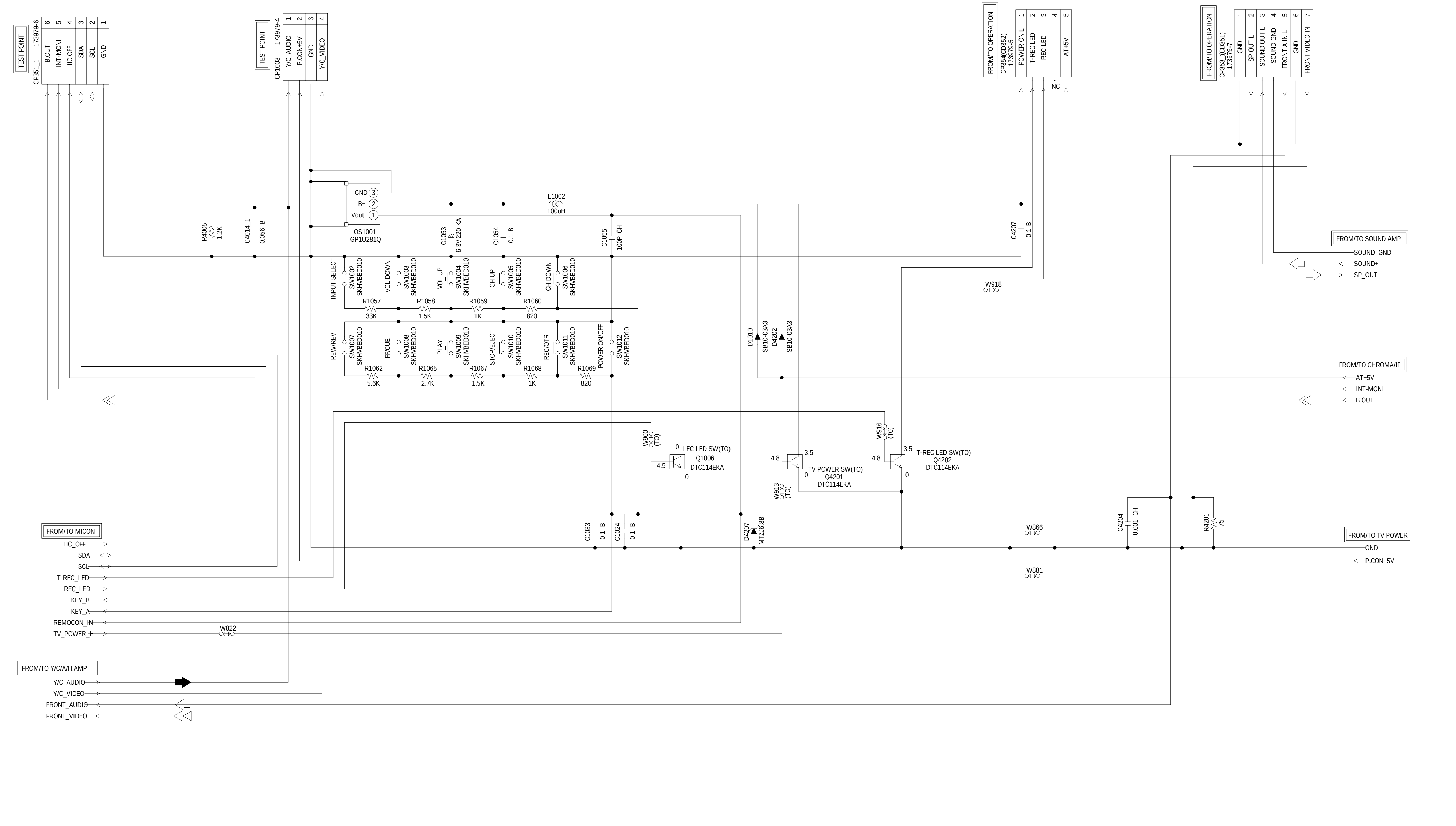
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

PCB800
VMX196

IN/OUT SCHEMATIC DIAGRAM

(SYSCON PCB)



CAUTION: DIGITAL TRANSISTOR

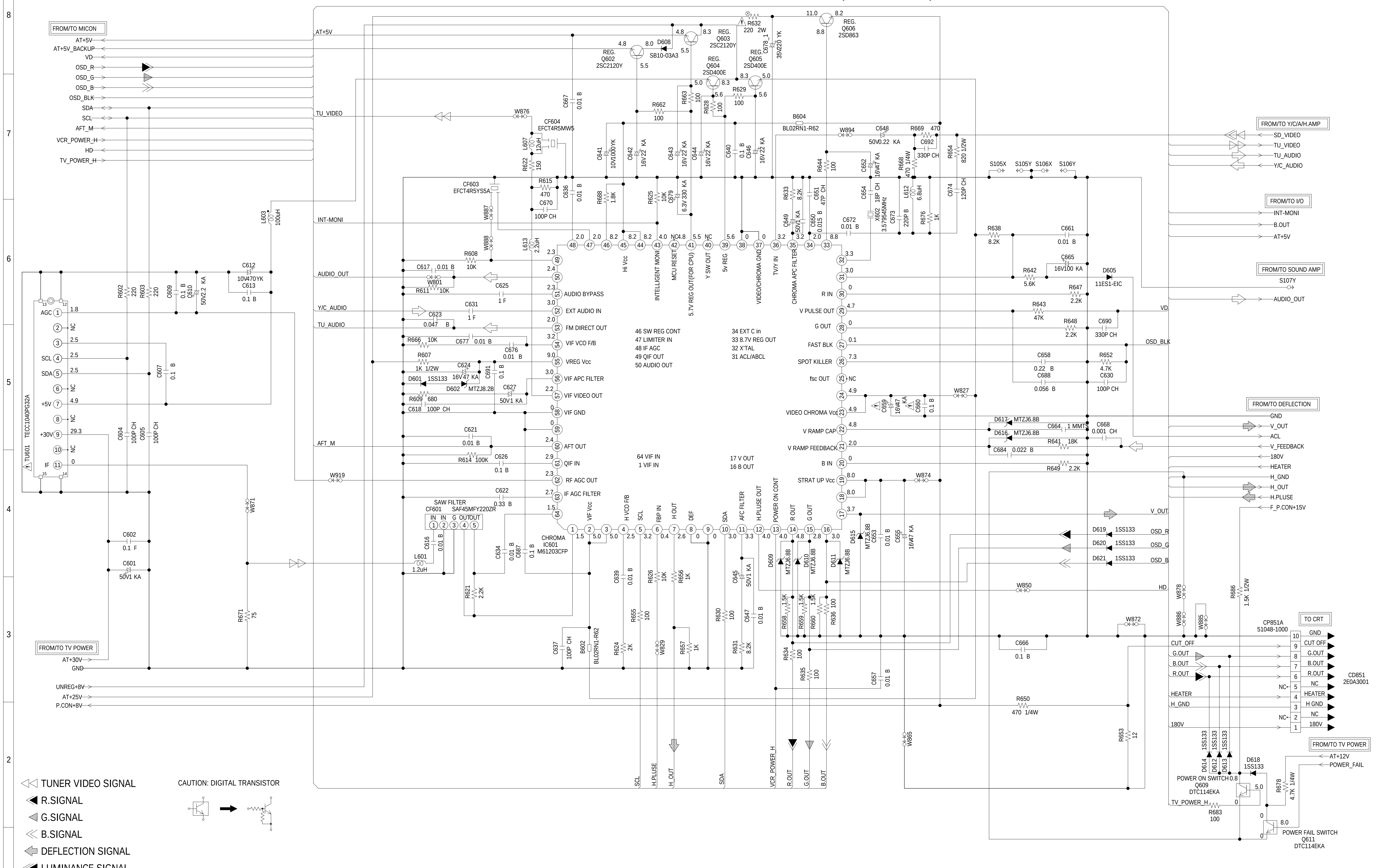
B.SIGNAL
TUNER VIDEO SIGNAL
AUDIO SIGNAL(REC)
AUDIO SIGNAL(PB)

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

PCB800
VMX196

CHROMA/IF SCHEMATIC DIAGRAM (SYSCON PCB)



TUNER VIDEO SIGNAL
R.SIGNAL
G.SIGNAL
B.SIGNAL
DEFLECTION SIGNAL
LUMINANCE SIGNAL
COLOR SIGNAL
PLAYBACK VIDEO SIGNAL

CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

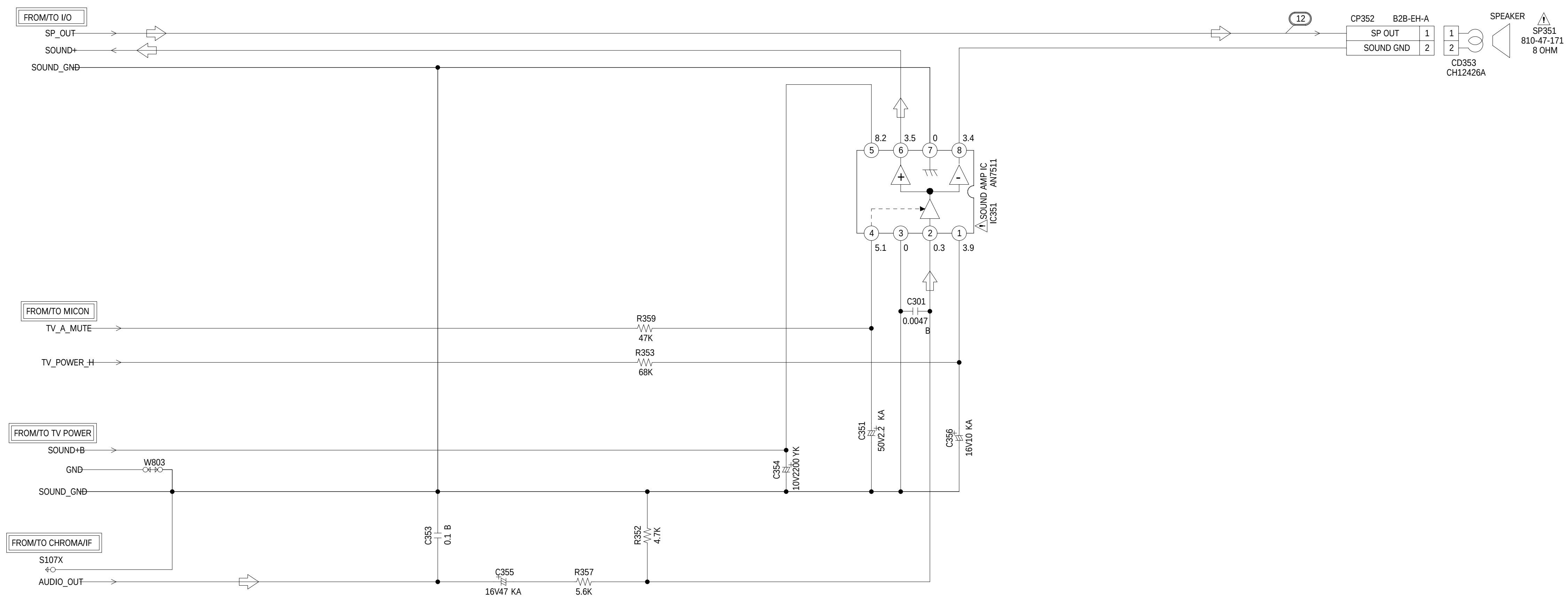
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

PCB800
VMX196

SOUND AMP SCHEMATIC DIAGRAM

(SYSCON PCB)



AUDIO SIGNAL(REC)

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

PCB800
VMX196

TV POWER SCHEMATIC DIAGRAM

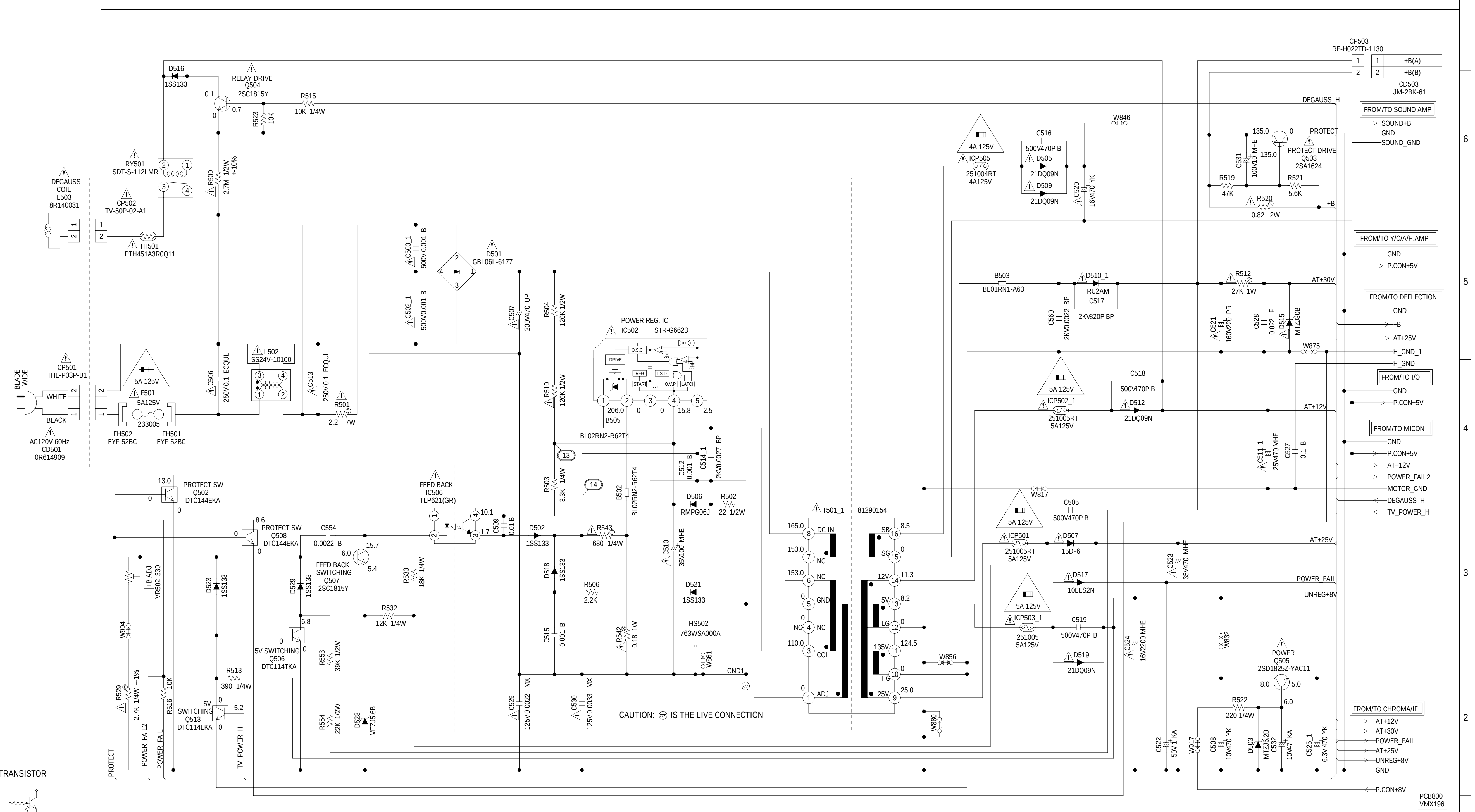
(SYSCON PCB)

5A 125V   4A 125V

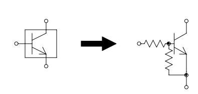
CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 5A 125V (F501,ICP501,ICP502,ICP503), AND 4A 125V(ICP505).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 5A 125V (F501,ICP501,ICP502,ICP503), ET 4A 125V(ICP505).

CAUTION: ICP501,ICP502,ICP503,AND ICP505 ARE MANUFACTURED BY LITTELFUSE INC.,TYPE 251.



CAUTION: DIGITAL TRANSISTOR



NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

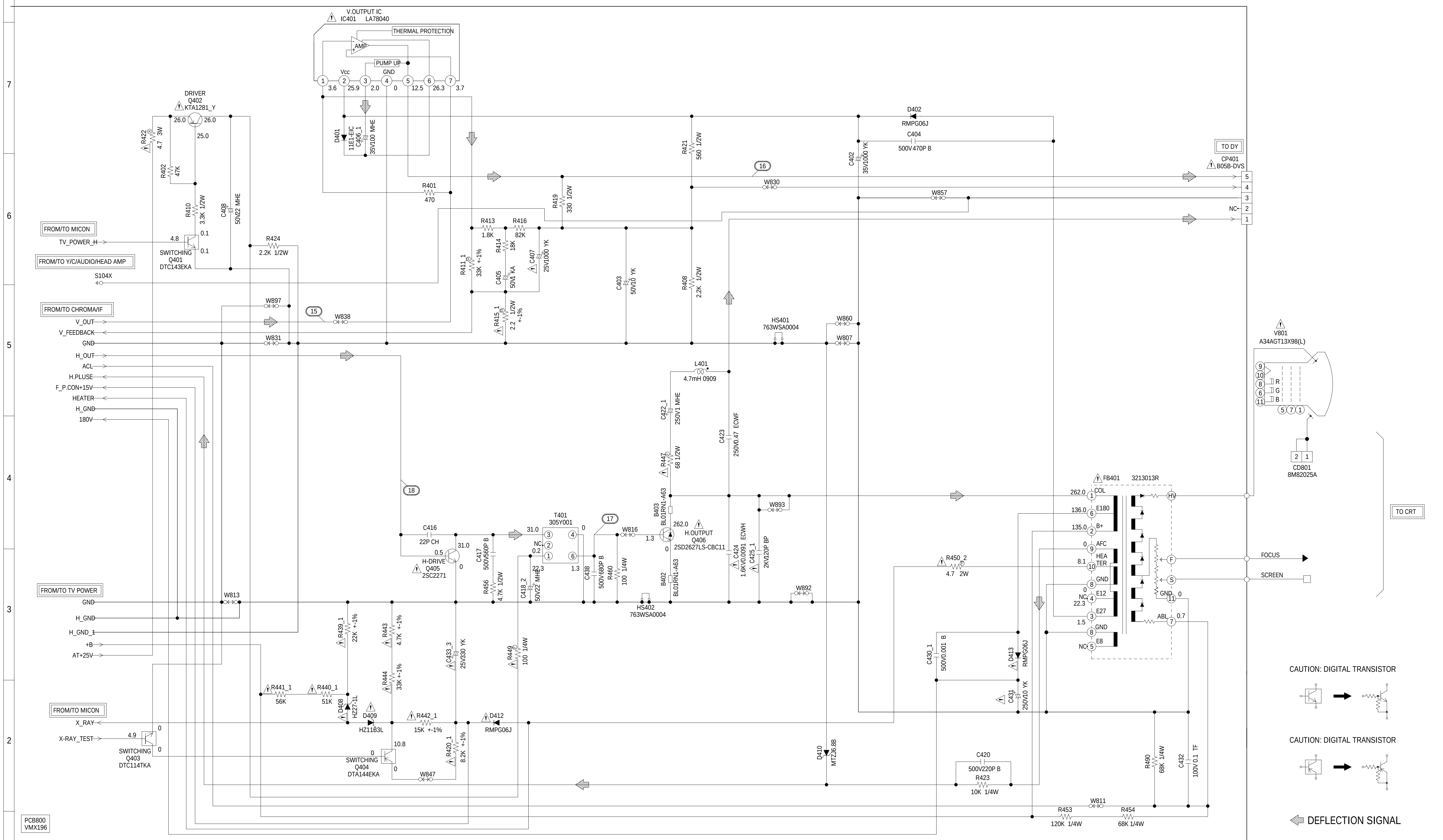
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

DEFLECTION SCHEMATIC DIAGRAM

(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

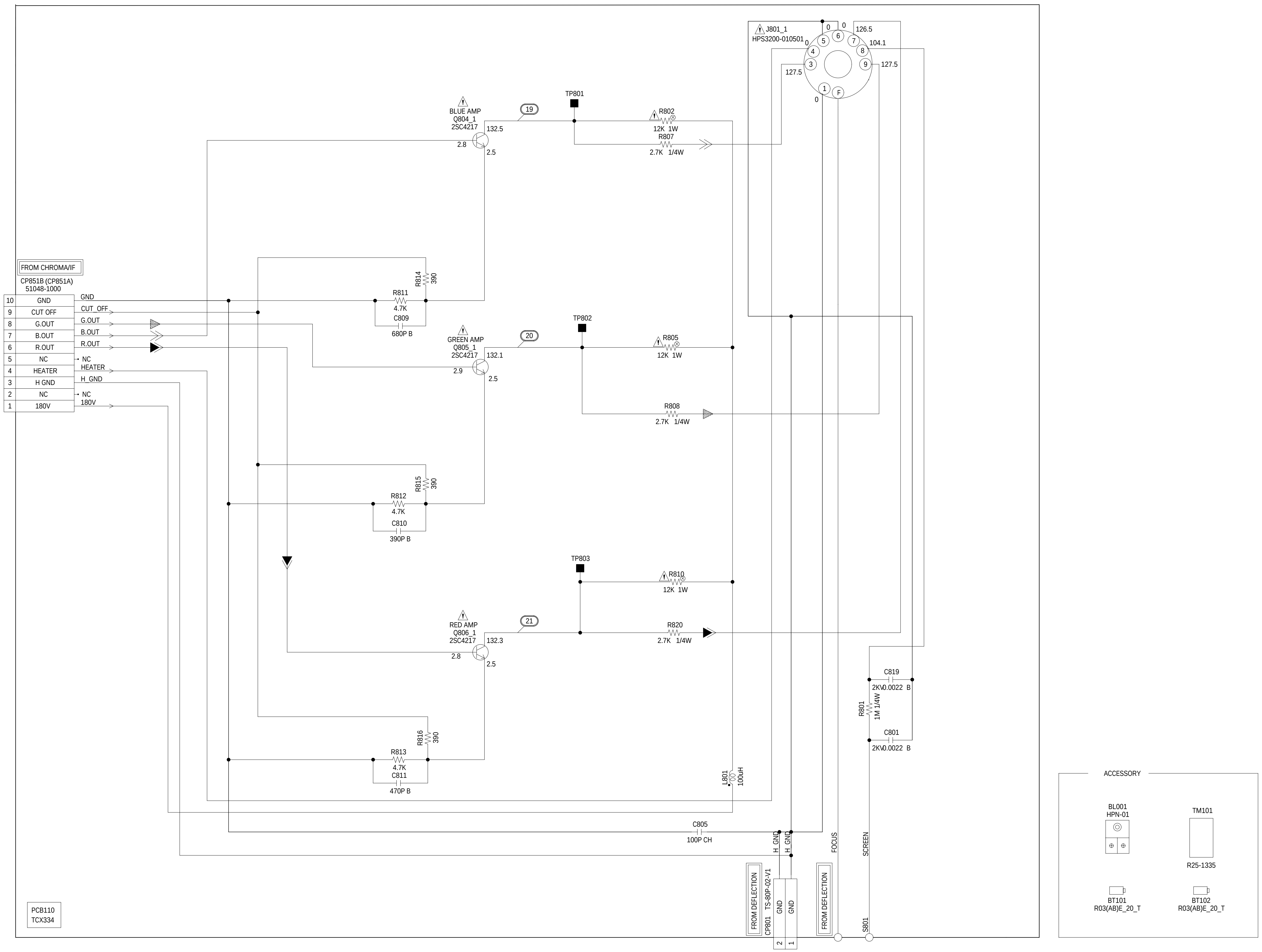
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

CRT SCHEMATIC DIAGRAM
(CRT PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

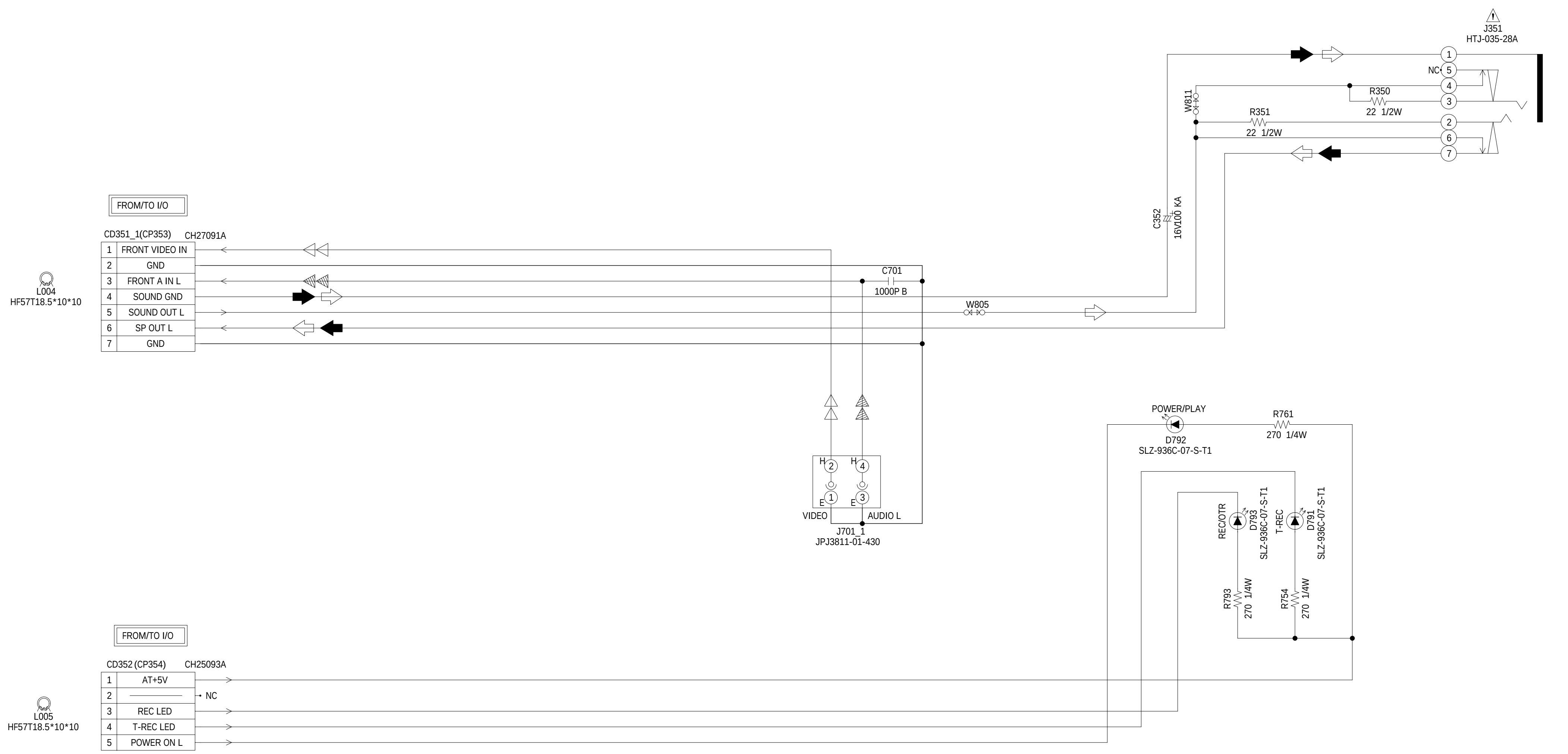
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

OPERATION SCHEMATIC DIAGRAM

(OPERATION PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

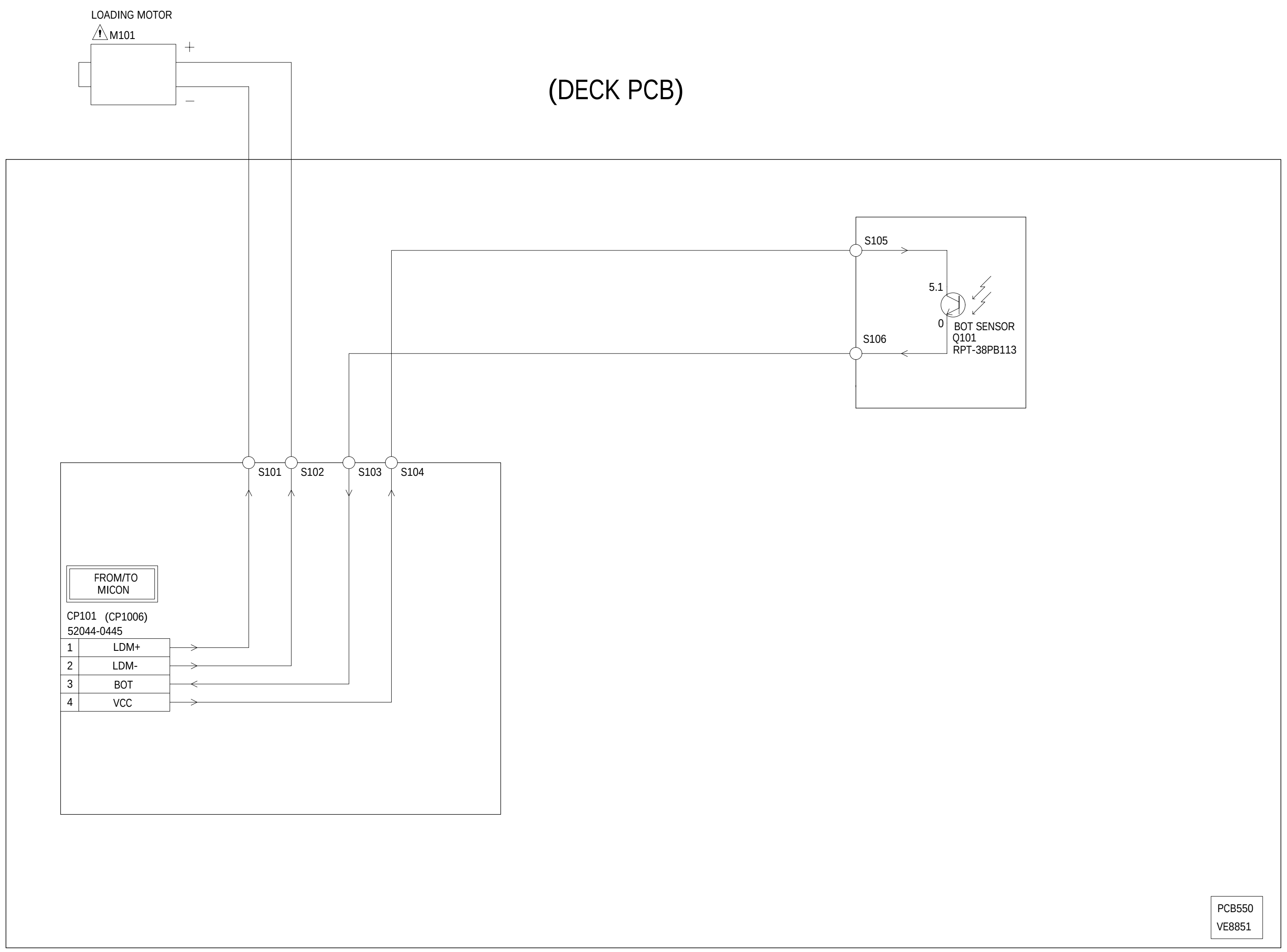
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

⇦ AUDIO SIGNAL(REC)
⬅ AUDIO SIGNAL(PB)
◁◁ TUNER VIDEO SIGNAL
◁◁ TUNER AUDIO SIGNAL

PCB030
TE9A16

DECK SCHEMATIC DIAGRAM



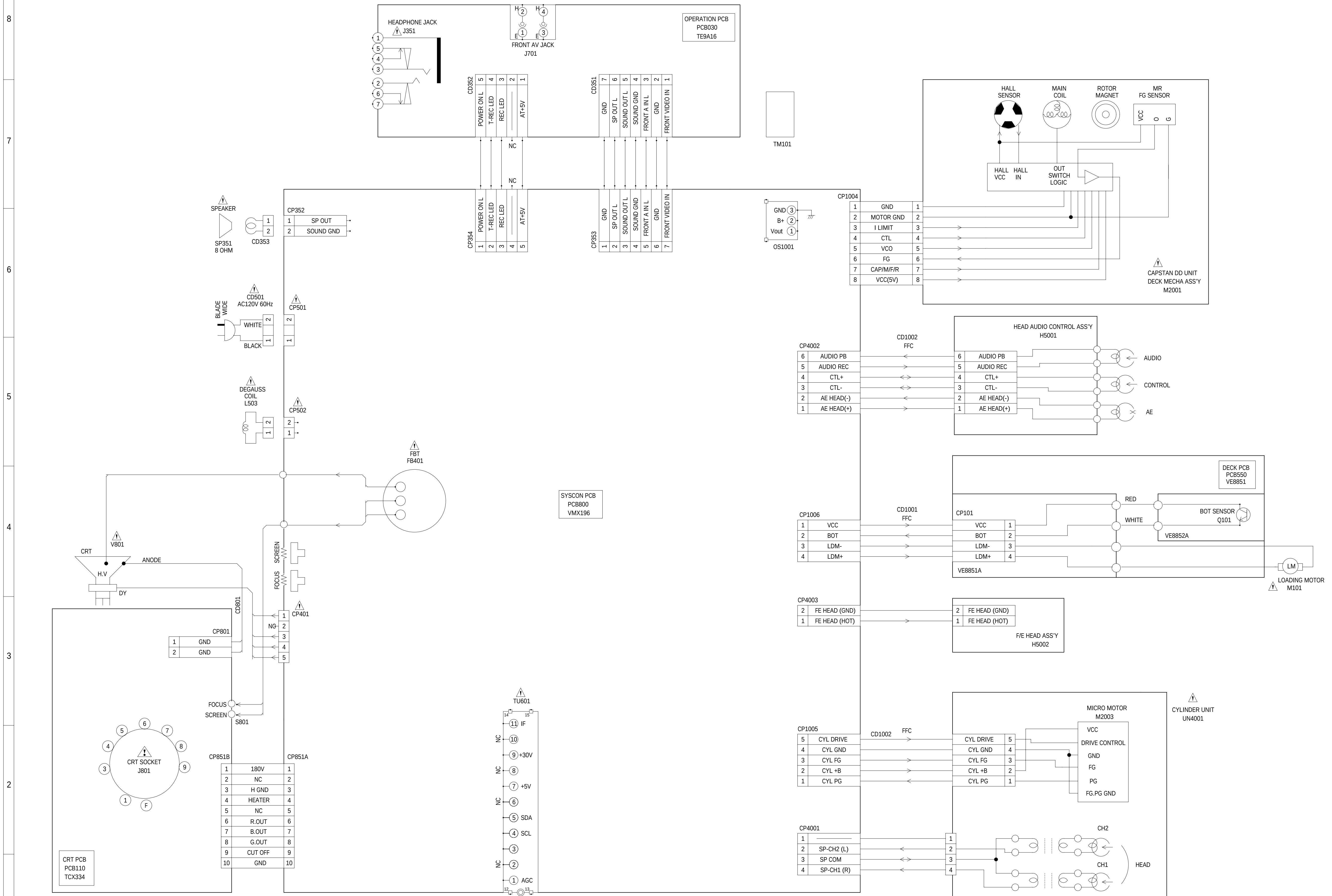
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

INTERCONNECTION DIAGRAM



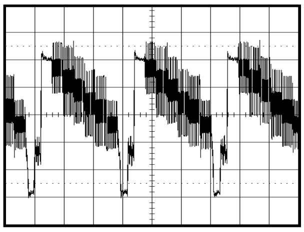
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY.

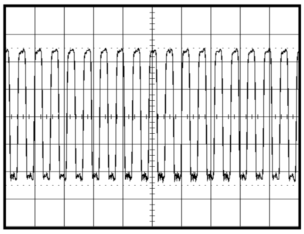
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

WAVEFORMS

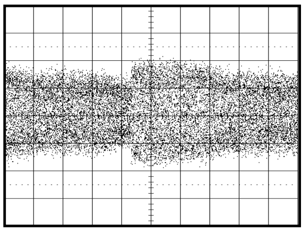
Y/C/AUDIO/HEAD AMP



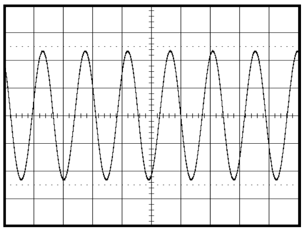
① REC/PB
0.5V 20µs/div



② REC/PB
100mV 0.5µs/div

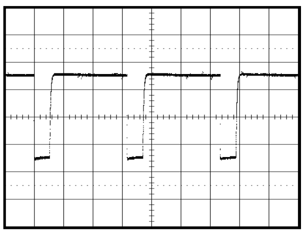


③ PB
100mV 5ms/div

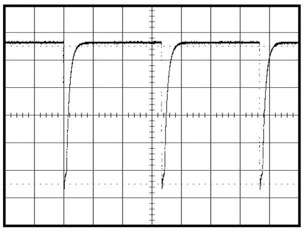


④ REC
20V 10µs/div

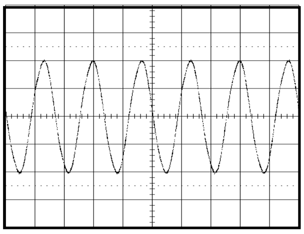
MICON



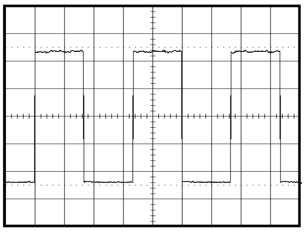
⑤ REC/PB
2V 20µs/div



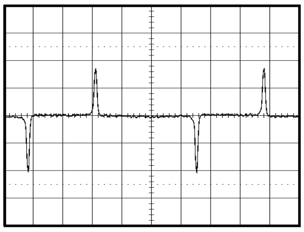
⑥ REC/PB
1V 5ms/div



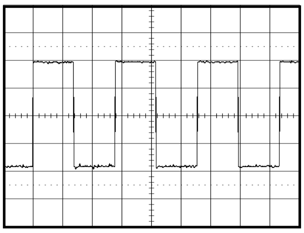
⑦ REC/PB
1V 50ns/div



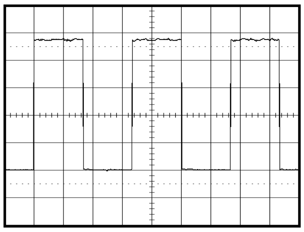
⑧ REC/PB
1V 10ms/div



⑨ PB
1V 2ms/div

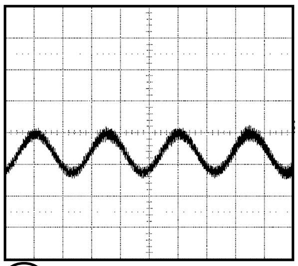


⑩ REC/PB
1V 0.5ms/div



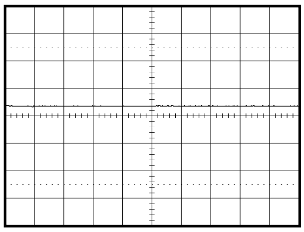
⑪ REC/PB
1V 10ms/div

SOUND AMP

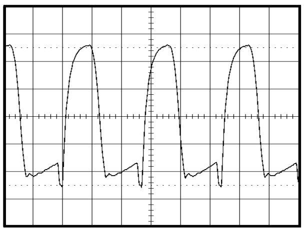


⑫ 200mV 0.1ms/div

TV POWER

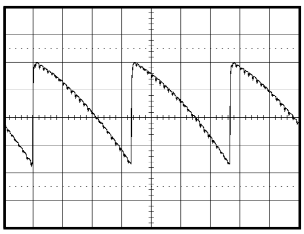


⑬ REC/PB
5V 0.1ms/div



⑭ REC/PB
0.5V 5µs/div

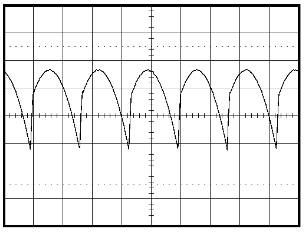
DEFLECTION



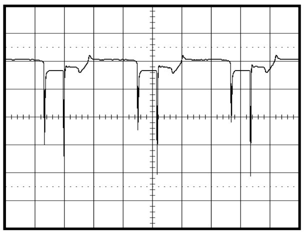
⑮ 0.5V 5ms/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

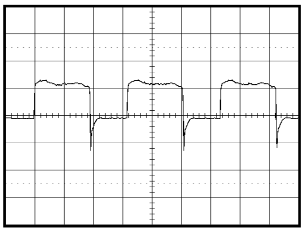
WAVEFORMS



⑯ 1V 10ms/div

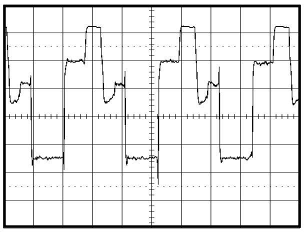


⑰ 5V 20µs/div

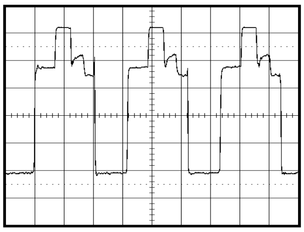


⑱ 0.5V 20µs/div

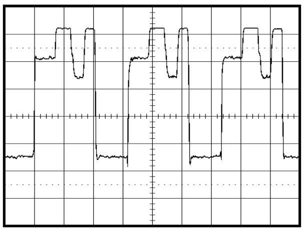
CRT



⑲ 20.0V 20µs/div



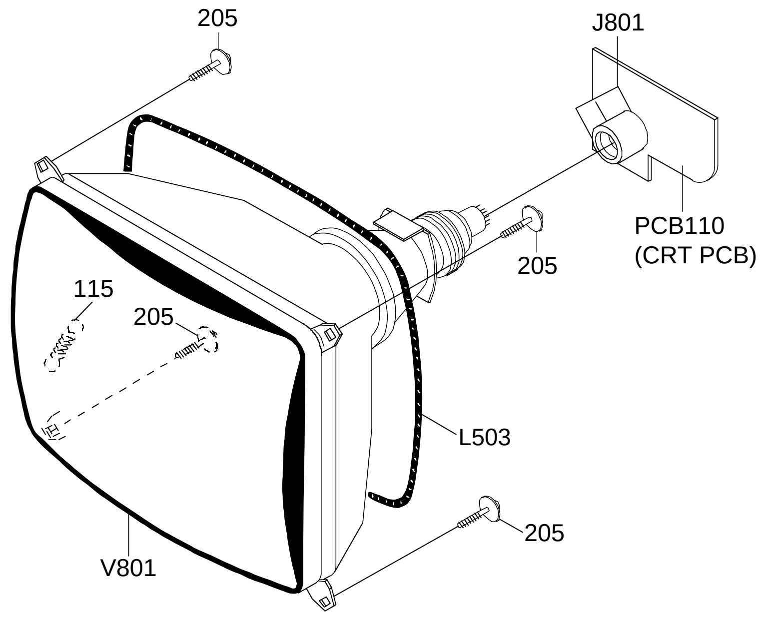
⑳ 20.0V 20µs/div

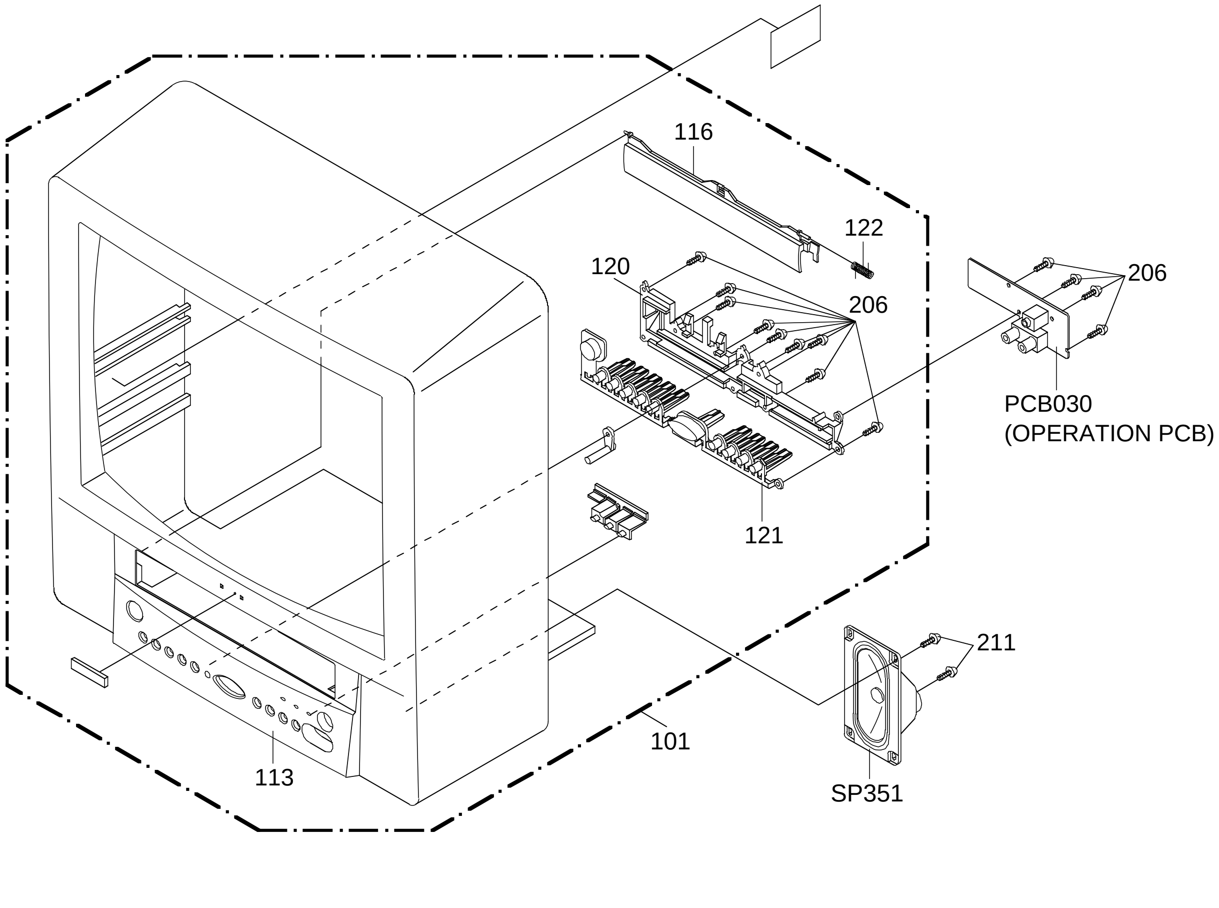


㉑ 20.0V 20µs/div

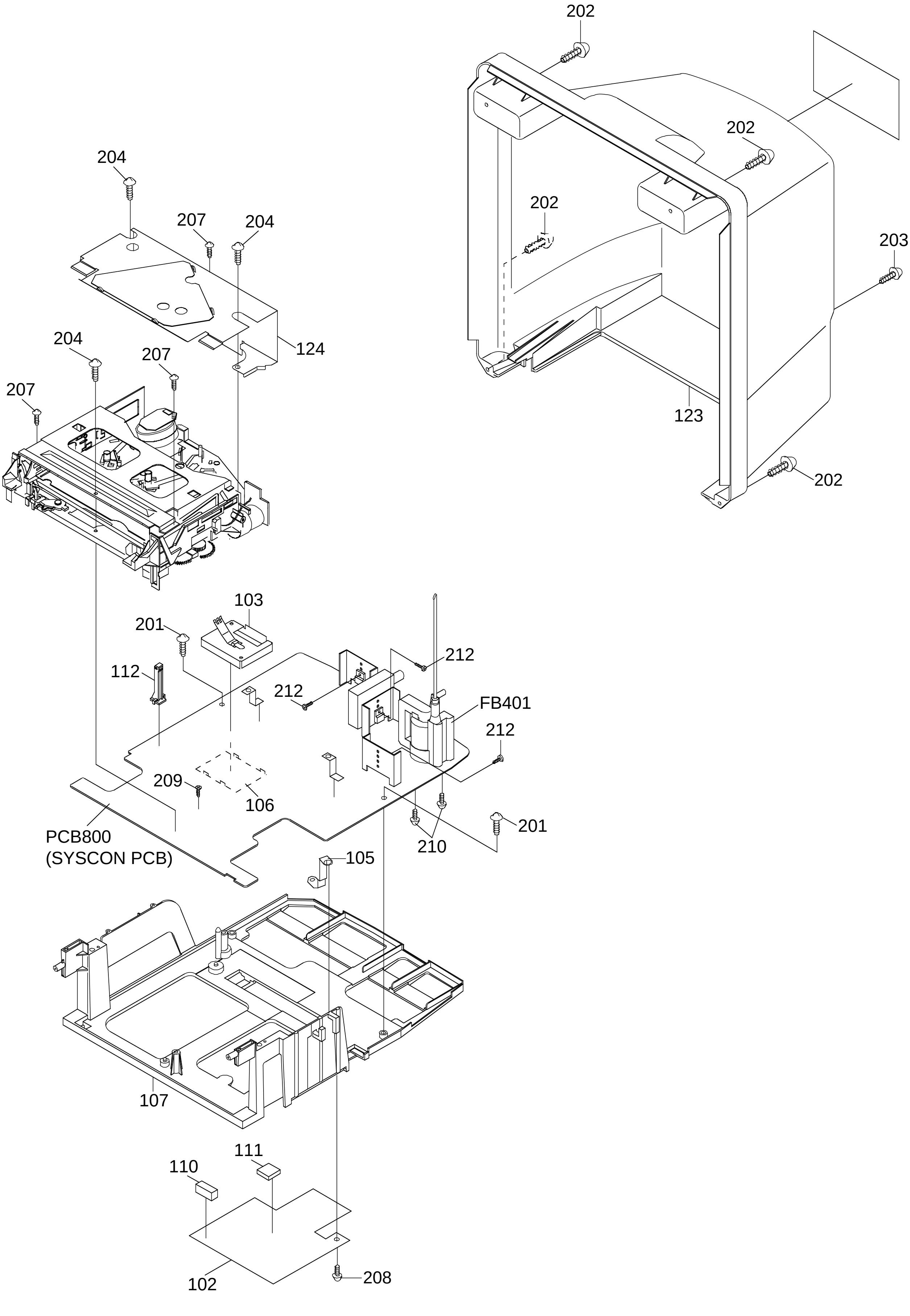
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW

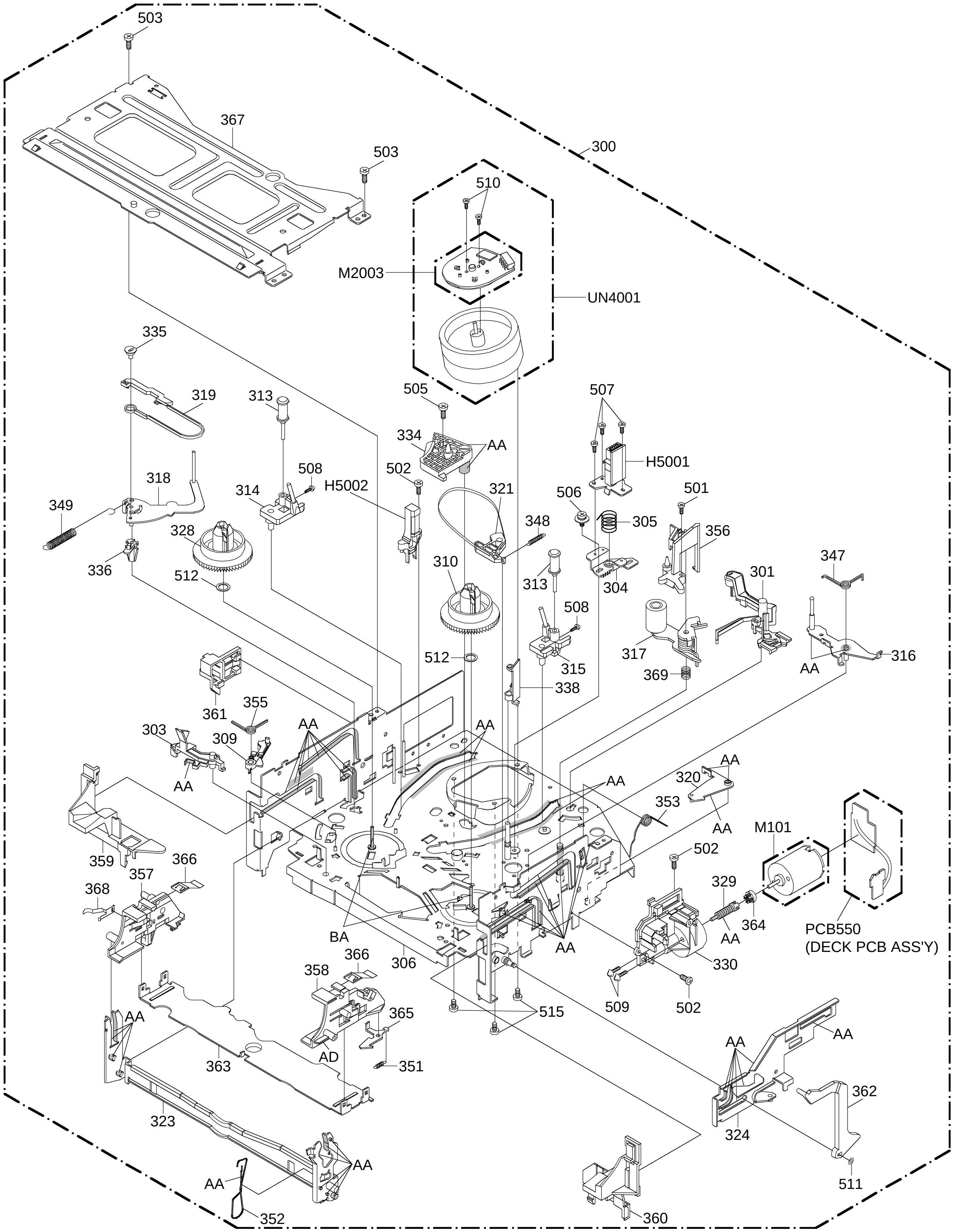




MECHANICAL EXPLODED VIEW



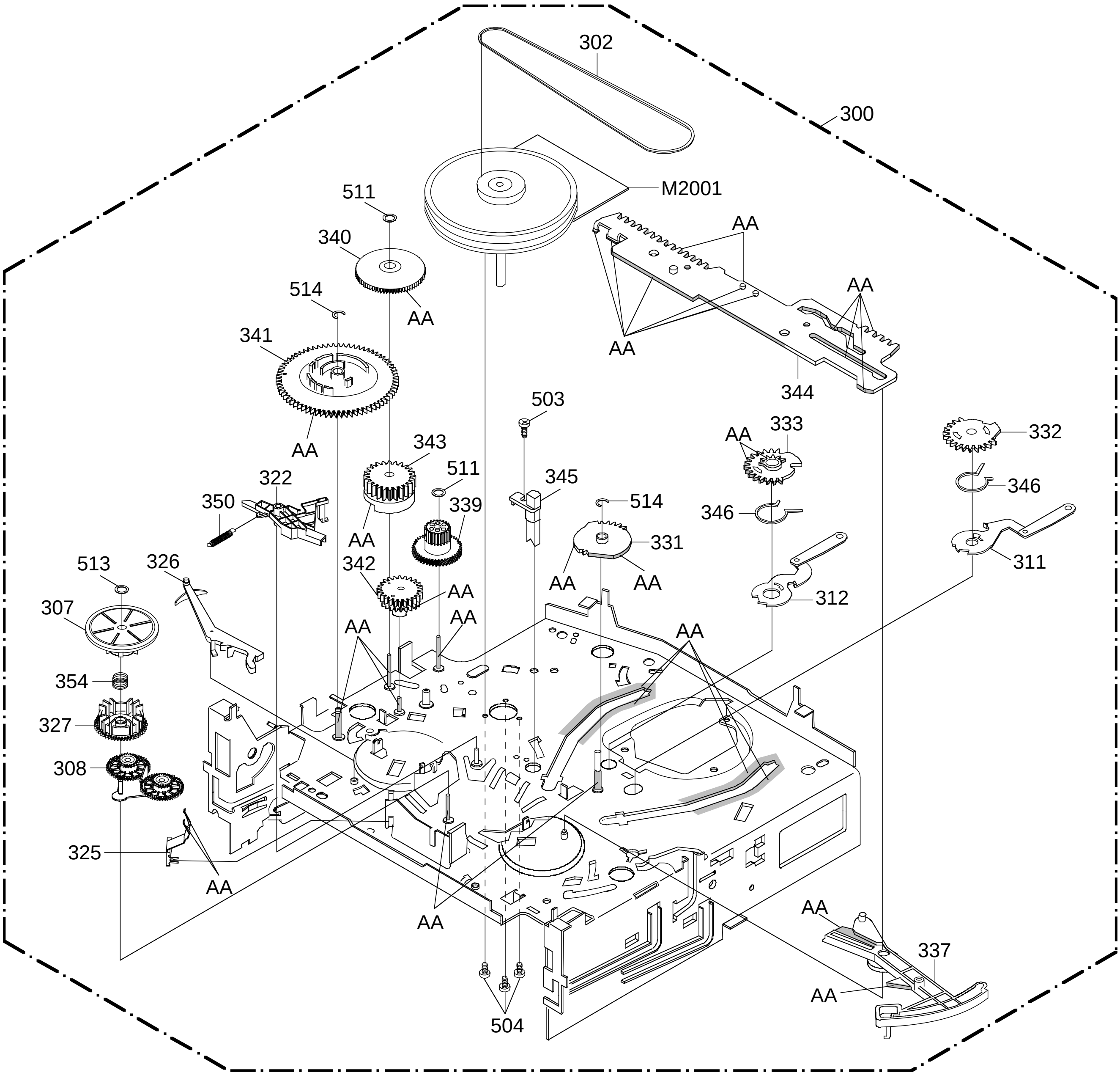
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA
OIL	BA

NOTE: Applying positions AA and BA for the grease or oil are displayed for this section.
Check if the correct grease or oil is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA
OIL	BA

NOTE: Applying positions AA and BA for the grease or oil are displayed for this section.
Check if the correct grease or oil is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	BZ610087	A545D0A720	CABINET,FRONT ASS'Y	
102	BZ710248	752WSAA028	SHIELD,BOTTOM	
103	BZ710269	752WSA0213	SHIELD,CASE HEAD AMP ASS'Y	
105	BZ710235	753WSA0120	PLATE,BOTTOM-EARTH	
106	BZ710304	753WSA0131	SHIELD,COVER HEAD AMP	
107	BZ710271	761WPA0196	HOLDER,DECK	
110	BZ710251	800WFA0037	CUSHION	15x5xT=6
111	BZ710252	800WFA0038	CUSHION	10x10xT=2
112	BZ710178	85OP700036	HOLDER,EOT SENSOR	
113	BZ710142	701WPJ0916	CABINET,FRONT	
115	BZ710009	741WUA0019	SPRING,EARTH	
116	BZ710143	712WPJ0671	FLAP	
120	BZ710008	738WPA0014	BUTTON,BASE	
121	BZ710144	735WPJ0134	BUTTON,FRAME	
122	BZ710010	743WKA0032	SPRING,FLAP	
123	BZ710272	702WPAA108	CABINET,BACK	
124	BZ710316	752WSA0223	PLATE,DECK SHIELD ASS'Y	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710262	8117540A04	SCREW,TAPPING(B0) TRUSS	4x10
204	BZ710034	8117140A24	SCREW,TAPPING(B0) PAN	4x12
205	BZ710321	8121F50B84	SCREW,TAPPING(B0) GW20	5x28
206	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
207	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
208	BZ710158	8110630604	SCREW,TAP TITE(P) BRAZIER	3x6
209	BZ710028	8110330804	SCREW,TAP TITE(P) FLAT	3x8
210	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
211	BZ710029	8110330A04	SCREW,TAP TITE(P) FLAT	3x10
212	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
---	BZ710305	792WHA0286	PACKAGE,TOP	
---	BZ710306	792WHA0287	PACKAGE,BOTTOM	
---	BZ710145	793WCD1212	GIFT BOX	
---	BZ614142	J545D001	INSTRUCITON BOOK	

CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
300	BZ610107	A545D0A420A	DECK ASSY	A545D0A420A
301	BZ710073	85OA500022	AHC ASS'Y	
302	BZ710193	85OP200290	BELT,CAPSTAN (S)	
303	BZ710132	85OP900710	LEVER,REC	
304	BZ710094	85OP500083	BASE,AC HEAD	
305	BZ710112	85OP800324	SPRING,AC HEAD	
306	BZ710194	85OA000367	MAIN CHASSIS ASS'Y (S-Z)	
307	BZ710195	85OA200082	CLUTCH ASS'Y(S2)	
308	BZ710196	85OA200080	ARM,IDLER ASS'Y (S)	
309	BZ710197	85OP600556	ARM,SS BRAKE (S)	
310	BZ710198	85OP200292	REEL,T (S)	
311	BZ710063	85OA300061	LOADING ARM S ASS'Y	
312	BZ710064	85OA300062	LOADING ARM T ASS'Y	
313	BZ614076	85OA400210	GUIDE ROLLER ASS'Y	
314	BZ710069	85OA400188	BASE,INCL S ASS'Y	
315	BZ710070	85OA400196	BASE,INCL T(S) ASS'Y	
316	BZ710200	85OA400199	P5-3 ARM ASS'Y(S)	
317	BZ710072	85OA400205	PINCH ROLLER BLOCK	
318	BZ710065	85OA400175	TENSION ARM ASS'Y	
319	BZ710201	85OA400184	TENSION BAND ASS'Y (S)	
320	BZ710067	85OA400178	PINCH ROLLER LEVER ASS'Y	
321	BZ710311	85OA600196	BRAKE T ASSY(S)	
322	BZ710203	85OA600191	CAP BRAKE ASS'Y(S)	
323	BZ710076	85OA900213	LINK ASS'Y	
324	BZ710077	85OA900216	LINK LEVER ASS'Y	
325	BZ710204	85OP200284	LEVER,CLUTCH (S)	
326	BZ710205	85OP200285	ACTUATOR,CLUTCH	
327	BZ710206	85OP200298	GEAR,COUPLING(S2)	
328	BZ710207	85OP200291	REEL,S (S)	
329	BZ710096	85OP600541	WORM	
330	BZ710105	85OP600563	BRACKET,MOTOR	
331	BZ710086	85OP300178	GEAR,MAIN LOADING	
332	BZ710087	85OP300179	GEAR,LOADING S	
333	BZ710088	85OP300180	GEAR,LOADING T	
334	BZ710208	85OP300187	HOLDER,LOADING GEAR (S-Z)	
335	BZ710090	85OP400472	ADJUST,TENSION	
336	BZ710093	85OP400492	HOLDER,TENSION	
337	BZ710092	85OP400490	LEVER,TENSION	
338	BZ710091	85OP400475	COVER,P4	
339	BZ710097	85OP600543	GEAR,JOINT	
340	BZ710098	85OP600544	GEAR,MIDDLE	
341	BZ710209	85OP600554	CAM,MAIN (S)	
342	BZ710101	85OP600546	CAM,P5	
343	BZ710172	85OP600565	CAM,PINCH ROLLER	
344	BZ710210	85OP600561	ROD,MAIN(S)	
345	BZ710106	85OP700035	REFLECTOR,LED	
346	BZ710107	85OP800318	SPRING,LOADING GEAR	
347	BZ710211	85OP800334	SPRING,P5 (S)	
348	BZ710212	85OP800335	SPRING,BRAKE T (S)	
349	BZ710110	85OP800322	SPRING,TENSION	
350	BZ710213	85OP800336	SPRING,CAP BRAKE (S)	
351	BZ710118	85OP800342	SPRING,LOCKER (S)	
352	BZ710113	85OP800326	SPRING,LINK	
353	BZ710114	85OP800328	SPRING,DAMPER	
354	BZ710115	85OP800330	SPRING,RING	
355	BZ710214	85OP800337	SPRING,SS BRAKE (S)	
356	BZ710119	85OP900680	OPENER,CASS	
357	BZ710312	85OP900731	CASS SIDE L	
358	BZ710313	85OP900732	CASS SIDE R	
359	BZ710314	85OP900728	TAPE GUIDE L(P,R)	
360	BZ710315	85OP900729	TAPE GUIDE R	
361	BZ710216	85OP900714	COVER,SENSOR L3	
362	BZ710123	85OP900688	LEVER,FLAP	
363	BZ710124	85OP900690	CASS HOLDER	
364	BZ710095	85OP600540	DRIVER,WORM	
365	BZ710217	85OP900713	LOCKER,R2	
366	BZ710127	85OP900694	SPRING,PACK	
367	BZ710128	85OP900695	BRACKET,TOP	
368	BZ710129	85OP900696	SPRING,CASS EARTH	
369	BZ710117	85OP800341	SPRING,P/R ARM	

CHASSIS REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
	501	BZ710048	8107126A04	SCREW,TAP TITE(S) PAN	2.6x10
	502	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
	503	BZ710017	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
	504	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
	505	BZ710052	810A126804	SCREW/WASHER(A)	M2.6x8
	506	BZ710053	810B126404	SCREW/WASHER(B)	M2.6x4
	507	BZ710046	8102120604	SCREW,PAN	M2x6
	508	BZ710045	8102120304	SCREW,PAN	M2x3
	509	BZ710047	8102130304	SCREW,PAN	M3.0x3.0
	510	BZ710051	810A123504	SEMS A	M2.3x5.0
	511	BZ710055	82P266005N	POLYSLIDER WASHER(CUT)	2.6x6.0xT0.5
	512	BZ710218	82Q2647C5N	POLYSLIDER WASHER	2.6x4.7xT0.25
	513	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
	514	BZ710058	83ETW30000	E-RING	3.0
	515	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
	CP101	BZ614040	069R740018	CONNECTOR PCB SIDE	52044-0445
	H5001	BZ710040	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
	H5002	BZ710041	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
⚠	M101	BZ710044	1596P78001	MOTOR (LOADING)	MXN13FB11H
⚠	M2001	BZ710303	1510398032	CAPSTAN DD UNIT	F2QSB06
	M2003	BZ710042	1589V11007	MICRO MOTOR	EP14BD
	PCB550	BZ610053	A4C831B550	DECK PCB ASS'Y	VE8851
	Q101	BZ410026	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
⚠	UN4001	BZ610089	A545A0A500	CYLINDER UNIT ASSY	A545A0A500

ELECTRICAL REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
				RESISTORS	
⚠	R415	BZ210069	R426T22R2F	R,METAL	2.2 OHM 1/2W
⚠	R420	BZ210070	R801R7822F	RC	8.2K OHM 1/10W
	R422	BZ210071	R3X28B4R7J	R,METAL OXIDE	4.7 OHM 3W
⚠	R439	BZ210072	R801R7223F	RC	22K OHM 1/10W
⚠	R440	BZ210073	R801R7513J	RC	51K OHM 1/10W
⚠	R441	BZ210074	R801R7563J	RC	56K OHM 1/10W
⚠	R442	BZ210075	R801R7153F	RC	15K OHM 1/10W
⚠	R443	BZ210076	R801R7472F	RC	4.7K OHM 1/10W
⚠	R444	BZ210077	R801R7333F	RC	33K OHM 1/10W
⚠	R447	BZ210021	R65582680J	R,FUSE	68 OHM 1/2W
	R449	BZ210078	R65584101J	R,FUSE	100 OHM 1/4W
⚠	R450	BZ210079	R6558A4R7J	R,FUSE	4.7 OHM 2W
⚠	R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠	R501	BZ210043	R5Y2CE2R2J	R,CEMENT	2.2 OHM 7W
⚠	R510	BZ210081	R002T2124J	RC	120K OHM 1/2W
⚠	R512	BZ210082	R3X101273J	R,METAL	27K OHM 1W
⚠	R520	BZ210009	R3X28AR82J	R,METAL	0.82 OHM 2W
⚠	R529	BZ210084	R4X5T4272F	R,METAL	2.7K OHM 1/4W
⚠	R542	BZ210085	R33681R18J	R,METAL	0.18OHM 1W
⚠	R543	BZ210086	R635U4681J	R,FUSE	680 OHM 1/4W
	R632	BZ210087	R3X18A221J	R,METAL OXIDE	220 OHM 2W
⚠	R802	BZ210089	R3X181123J	R,METAL	12K OHM 1W
⚠	R805	BZ210089	R3X181123J	R,METAL	12K OHM 1W
⚠	R810	BZ210089	R3X181123J	R,METAL	12K OHM 1W
⚠	R1005	BZ210020	R615J12R7J	R,FUSE	2.7 OHM 1W
				CAPACITORS	
	C354	BZ110076	E02LF1222M	CE	2200 UF 10V
	C402	BZ110077	E02L04102M	CE	1000 UF 35V
⚠	C407	BZ110078	E02L03102M	CE	1000 UF 25V
	C423	BZ110030	P411F3474J	CMPP	0.47 UF 250V ECWF
⚠	C424	BZ110027	P414F9912H	CMPP	0.0091UF 1.6KV ECWH
⚠	C425	BZ110047	C01BBP7B2K	CC	120 PF 2KV BP
⚠	C433	BZ110079	E02LT3331M	CE	330 UF 25V
⚠	C502	BZ110080	C0J0B0513K	CC	0.001 UF 500V B
⚠	C503	BZ110080	C0J0B0513K	CC	0.001 UF 500V B
⚠	C506	BZ110035	P2122B104M	CMP	0.1 UF 250V ECQUL
⚠	C507	BZ110012	E51CGC471M	CE	470 UF 200V
	C508	BZ110099	E02LT1471M	CE	470 UF 10V
⚠	C510	BZ110018	E5EZT4101M	CE	100 UF 35V
⚠	C511	BZ110029	E5EZT3471M	CE	470 UF 25V
⚠	C513	BZ110035	P2122B104M	CMP	0.1 UF 250V ECQUL
	C514	BZ110004	C01BBP7K3K	CC	0.0027UF 2KV BP
	C517	BZ110006	C01BBP7W2K	CC	820 PF 2KV BP
⚠	C520	BZ110081	E02LT2471M	CE	470 UF 16V
⚠	C521	BZ110013	E53VFB221M	CE	220 UF 160V
⚠	C524	BZ110100	E5EZ02222M	CE	2200 UF 16V
⚠	C529	BZ110008	C034E0JH3M	CC	0.0022UF 125V MX
⚠	C530	BZ110082	C034F0JL3M	CC	0.0033UF 125V MX
	C560	BZ110003	C01BBP7H3K	CC	0.0022UF 2KV BP
	C701	BZ110098	CHGTB0413K	CC	0.001 UF 50V B
	C801	BZ110009	C13HB07H3K	CC	0.0022UF 2KV B
	C819	BZ110009	C13HB07H3K	CC	0.0022UF 2KV B
⚠	C1001	BZ110083	E02LU3101M	CE	100 UF 25V
				DIODES	
	D401	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
	D402	BZ410014	D2LTPG06J0	DIODE,SILICON	RMPG06J-G3
⚠	D408	BZ410018	D94TA27011	DIODE,ZENER	HZ27-1L TD
⚠	D409	BZ410017	D94TA11B13	DIODE,ZENER	HZ11B3L TD
	D410	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
⚠	D412	BZ410014	D2LTPG06J0	DIODE,SILICON	RMPG06J-G3
⚠	D413	BZ410014	D2LTPG06J0	DIODE,SILICON	RMPG06J-G3
⚠	D501	BZ410044	D4LZBL06L0	DIODE	GBL06L-6177
	D502	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D503	BZ410066	D97U06R21B	DIODE,ZENER	MTZJ6.2B T-77
⚠	D505	BZ410010	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
	D506	BZ410014	D2LTPG06J0	DIODE,SILICON	RMPG06J-G3
	D507	BZ410057	D28015DF60	DIODE,SILICON	15DF6
⚠	D509	BZ410010	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
⚠	D510	BZ410028	D2BTRU2AM0	DIODE,SILICON	RU2AM V1
⚠	D512	BZ410010	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
⚠	D515	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
	D516	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠	D517	BZ410011	D28TELS2N2	DIODE RECTIFER	10ELS2N-TA1B2
	D518	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠	D519	BZ410010	D28T21DQN9	DIODE SCHOTTKY	21DQ09N-TA2B1
	D521	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D523	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
				DIODES	
	D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
	D529	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D602	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
	D605	BZ410059	D2WT11ES10	DIODE,SILICON	11ES1-EIC
	D608	BZ410008	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
	D609	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D610	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D611	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D612	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D613	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D614	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D615	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D616	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D617	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D618	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D619	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D620	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D621	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D791	BZ410005	002132Q130	LED	SLZ-936C-07-S-T1
	D792	BZ410005	002132Q130	LED	SLZ-936C-07-S-T1
	D793	BZ410005	002132Q130	LED	SLZ-936C-07-S-T1
	D1001	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
	D1002	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
	D1003	BZ410004	0010600060	LED	SID1050CM
	D1004	BZ410016	D92T1120B0	DIODE,ZENER	RD12FB-T7
	D1005	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
	D1007	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D1008	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D1010	BZ410008	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
	D1014	BZ410020	D97U05R11B	DIODE,ZENER	MTZJ5.1B T-77
	D4005	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D4006	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
	D4202	BZ410008	D23U1003A3	DIODE,SCHOTTKY	SB10-03A3
	D4207	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
				ICS	
⚠	IC351	BZ611001	I01DP75110	IC	AN7511
⚠	IC401	BZ611025	I03TD80400	IC	LA78040
⚠	IC502	BZ611041	I2BT066230	IC	STR-G6623
⚠	IC506	BZ410055	0002500450	PHOTO COUPLER	TLP621(GR)
	IC601	BZ611037	I06FC1203C	IC	M61203CFP
	IC1001	BZ611042	I56F57043B	IC	OEC7043B
	IC1002	BZ611012	I9UJ0T600H	IC	PST600H
⚠	IC1003	BZ611018	I07SQ69550	IC	BA6955N
	IC1099	BZ610083	A545D0A015	IC	S-24C02BDP-1A
	IC4001	BZ611023	I03F31067S	IC	LA71067SM-MPB
				TRANSISTORS	
	Q401	BZ510019	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
	Q402	BZ510008	TB3T008920	TRANSISTOR,SILICON	2SB892(S,T)-AE
	Q403	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
	Q404	BZ510049	TPYJD05001	COMPOUND TRANSISTOR	DTA144EKAT146
⚠	Q405	BZ510010	TC3T022710	TRANSISTOR,SILICON	2SC2271(D,E)-AE
⚠	Q406	BZ510036	TD30026270	TRANSISTOR SILICON	2SD2627LS-CBC11
	Q502	BZ510045	TNYJD05001	COMPOUND TRANSISTOR	DTC144EKAT146
⚠	Q503	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
⚠	Q504	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
	Q505	BZ611046	TD3Q018250	TRANSISTOR,SILICON	2SD1825Z-YAC11
	Q506	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
	Q507	BZ510012	TC5T018154	TRANSISTOR,SILICON	2SC1815Y(TPE2)
	Q508	BZ510045	TNYJD05001	COMPOUND TRANSISTOR	DTC144EKAT146
	Q513	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
	Q602	BZ510044	TC5T021204	TRANSISTOR,SILICON	2SC2120Y(TPE2)
	Q603	BZ510044	TC5T021204	TRANSISTOR,SILICON	2SC2120Y(TPE2)
	Q604	BZ510042	TDWT00400E	TRANSISTOR,SILICON	2SD400E
	Q605	BZ510042	TDWT00400E	TRANSISTOR,SILICON	2SD400E
	Q606	BZ510050	TD3T008630	TRANSISTOR,SILICON	2SD863(E,F)-AE
	Q609	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
	Q611	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
⚠	Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
⚠	Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
⚠	Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
	Q1001	BZ410049	0002700590	PHOTO COUPLER	RPI-301
	Q1002	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
	Q1003	BZ410003	0002G00550	PHOTO COUPLER	GP1S94L
	Q1004	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
⚠	Q1005	BZ410049	0002700590	PHOTO COUPLER	RPI-301
	Q1006	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
			TRANSISTORS	
Q1009	BZ410003	0002G00550	PHOTO COUPLER	GP1S94L
Q1013	BZ410042	0000100380	PHOTO TRANSISTOR	PNA2604M010R
Q1023	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q1024	BZ510019	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q4001	BZ510033	TC3T033310	TRANSISTOR,SILICON	2SC3331(S,T,U)-A
Q4002	BZ510033	TC3T033310	TRANSISTOR,SILICON	2SC3331(S,T,U)-A
Q4003	BZ510047	TPYTC03001	COMPOUND TRANSISTOR	DTA124ESTP
Q4005	BZ510003	TA3T013180	TRANSISTOR,SILICON	2SA1318(S,T)-AA
Q4006	BZ510031	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA
Q4007	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4008	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4009	BZ510048	T6YA1037K0	TRANSISTOR,SILICON	2SA1037KT147
Q4010	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4012	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4201	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
Q4202	BZ510020	TNYJB05001	COMPOUMD TRANSISTOR	DTC114EKAT146
			COILS &TRANSFORMERS	
L004	BZ310022	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10
L005	BZ310022	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10
L401	BZ310004	021679472K	COIL	4.7 MH
⚠ L502	BZ310075	029X000087	COIL,LINE FILTER	SS24V-10100
⚠ L503	BZ310076	028R140031	COIL,DEGAUSS	8R140031
L601	BZ310085	021LA61R2M	COIL	1.2 UH
L603	BZ310002	021673101K	COIL	100 UH
L607	BZ310038	021LA6120K	COIL	12 UH
L612	BZ310068	021LA66R8K	COIL	6.8 UH
L613	BZ310009	021LA62R2K	COIL	2.2 UH
L801	BZ310001	021673101J	COIL	100 UH
L1001	BZ310009	021LA62R2K	COIL	2.2 UH
L1002	BZ310079	021LA6101J	COIL	100 UH
L4001	BZ310041	02167F101J	COIL	100 UH
L4002	BZ310041	02167F101J	COIL	100 UH
L4003	BZ310001	021673101J	COIL	100 UH
L4004	BZ310024	0326230038	COIL,TRAP	2623003
L4005	BZ310040	02167F470J	COIL	47 UH
L4007	BZ310079	021LA6101J	COIL	100 UH
L4008	BZ310041	02167F101J	COIL	100 UH
L4009	BZ310041	02167F101J	COIL	100 UH
L4010	BZ310041	02167F101J	COIL	100 UH
T401	BZ310080	03305Y0018	TRANS.,HORIZONTAL DRIVE	305Y001
⚠ T501	BZ310081	0481290154	TRANSFORMER,SWITCHING	81290154
T4001	BZ310023	031626007S	COIL,BIAS OSC	1626007
			JACKS	
⚠ J351	BZ614002	060G131014	RCA JACK	HTJ-035-28A
J701	BZ614001	0602101020	JACK,RCA	JPJ3811-01-430
⚠ J801	BZ614004	066X120014	SOCKET,CATHODE RAY TUBE	HPS3200-010501
			SWITCHES	
SW1001	BZ612002	0508221001	SWITCH (LEAF)	SPVF130100
SW1002	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1003	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1004	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1005	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1006	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1007	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1008	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1009	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1010	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1011	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
SW1012	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010
			VARIABLE RESISTORS	
VR502	BZ210024	V1163L2BTC	VOLUME,SEMI FIXED	EVNCYAA03BY2
			P.C.BOARD ASSEMBLIES	
PCB030	BZ610084	A545D0A03A	PCB ASS'Y	TE9A16A
PCB110	BZ610085	A545D0A11A	PCB ASS'Y	TCX334A
PCB550	BZ610053	A4C831B550	SEE CHASSIS REPLACEMENT PARTS LIST	
PCB800	BZ610086	A545D0A01A	PCB ASS'Y	VMX196A
			MISCELLANEOUS	
B402	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B403	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B502	BZ310015	024AT03482	CORE,BEADS	BL02RN2-R62T4
B503	BZ310016	024AT03655	CORE,BEADS	BL01RN1-A63T6
B505	BZ310015	024AT03482	CORE,BEADS	BL02RN2-R62T4
B602	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2
B604	BZ310045	024AT03481	CORE,BEADS	BL02RN1-R62T2
BL001	BZ310014	023C00022A	COIL BALUN	HPN-01
CD351	BZ614131	06CH27091A	CORD CONNECTOR	CH27091A
CD352	BZ614132	06CH25093A	CORD CONNECTOR	CH25093A

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
			MISCELLANEOUS	
CD353	BZ614096	06CH12426A	CORD CONNECTOR	CH12426A
⚠ CD501	BZ614053	120R614909	CORD,AC	0R614909
CD503	BZ614133	069X620040	CONNECTOR	JM-2BK-61
CD801	BZ614007	068M82025A	CORD CONNECTOR	8M82025A
CF601	BZ613014	1022T45R72	FILTER,SAW	SAF45MFY220ZR
CF603	BZ613015	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A
CF604	BZ613016	1011T4R517	FILTER,CERAMIC	EFCT4R5MW5
CP351	BZ614135	0694260139	CONNECTOR PCB SIDE	173979-6
CP352	BZ614019	069X120249	CONNECTOR PCB SIDE	B2B-EH-A
CP353	BZ614102	0694270139	CONNECTOR PCB SIDE	173979-7
CP354	BZ614136	0694250139	CONNECTOR PCB SIDE	173979-5
⚠ CP401	BZ614020	069X450029	CONNECTOR PCB SIDE	B05B-DVS
⚠ CP501	BZ614012	0697320039	CORD,UX CONNECTOR	THL-P03P-B1
⚠ CP502	BZ614018	069W420029	CONNECTOR PCB SIDE	TV-50P-02-A1
CP503	BZ614137	069X620030	CONNECTOR PCB SIDE	RE-H022TD-1130
CP801	BZ614017	069W320018	CONNECTOR PCB SIDE	TS-80P-02-V1
CP1003	BZ614138	0694240139	CONNECTOR PCB SIDE	173979-4
CP1004	BZ614010	0697280590	CONNECTOR PCB SIDE	TMC-J08P-B1
CP1005	BZ614049	069J750029	CONNECTOR PCB SIDE	IMSA-9604S-05Z14
CP1006	BZ614014	069J740029	CONNECTOR PCB SIDE	IMSA-9604S-04Z14
CP4001	BZ614054	0697240600	CONNECTOR PCB SIDE	TOC-C04X-B1
CP4002	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14
CP4003	BZ614009	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1
CP851A	BZ614139	067R010019	WIRE HOLDER	51048-1000
CP851B	BZ614139	067R010019	WIRE HOLDER	51048-1000
CUS011	BZ710001	800WF00004	CUSHION-A	
CUS011	BZ710001	800WF00004	CUSHION-A	
CUS012	BZ710002	800WF00019	CUSHION-C	
CUS013	BZ710001	800WF00004	CUSHION-A	
CUS014	BZ710001	800WF00004	CUSHION-A	
CUS015	BZ710001	800WF00004	CUSHION-A	
CUS016	BZ710001	800WF00004	CUSHION-A	
CUS017	BZ710001	800WF00004	CUSHION-A	
EL001	BZ614043	124116281A	EYE LET	XRY16X28BD
EL002	BZ614044	124120301A	EYE LET	XRY20X30BD
⚠ F501	BZ614033	081PA05003	FUSE	233005-MB000
⚠ FB401	BZ310082	043213013R	TRANSFORMER,FLYBACK	3213013R
FH501	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH502	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
⚠ ICP501	BZ614140	083PC05003	MICRO FUSE	251005RT
⚠ ICP502	BZ614140	083PC05003	MICRO FUSE	251005RT
⚠ ICP503	BZ614036	083PC05002	MICRO FUSE	251005
⚠ ICP505	BZ614140	083PC04003	MICRO FUSE	251004RT
OS1001	BZ614031	0779014002	REMOTE RECEIVER	GP1U281Q
⚠ RY501	BZ612008	0560Q20114	RELAY	SDT-S-112LMR
⚠ SP351	BZ614029	070C533008	SPEAKER	810-47-171
⚠ TH501	BZ410056	DF20A3R0Q0	DEGAUSS ELEMENT	PTH451A3R0Q11
TM101	BZ614055	076R0DA010	TRANSMITTER	R25-1335
⚠ TU601	BZ610078	0145K00053	TUNER,VHF-UHF	TECC1040PG32A
⚠ V801	BZ614141	098Q1404B2	CRT W/DY	A34AGT13X98(L)
X602	BZ613004	100CT3R505	CRYSTAL	HC-49/C
X1001	BZ613002	100CT01207	CRYSTAL	HC-49/U-S
X1002	BZ613006	100DA32R01	CRYSTAL	DT-26
X4001	BZ613008	100CF3R512	CRYSTAL	HC-49/U

RESISTOR

RC.................. CARBON RESISTOR

CAPACITORS

CC.................. CERAMIC CAPACITOR
CE.................. ALUMI ELECTROLYTIC CAPACITOR
CP.................. POLYESTER CAPACITOR
CPP................. POLYPROPYLENE CAPACITOR
CPL................. PLASTIC CAPACITOR
CMP...................... METAL POLYESTER CAPACITOR
CMPL............... METAL PLASTIC CAPACITOR
CMPP............... METAL POLYPROPYLENE CAPACITOR

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